



# *Syllabus*

## **MBBS**

at the

## **HIMS**

Hind Institute of Medical Sciences  
Mau, Ataria, Sitapur, UP- 261303

# C O N T E N T S

<i>S. No.</i>	<i>Subject</i>
1.	Anatomy
2.	Biochemistry
3.	Physiology
4.	Forensic Medicine & Toxicology
5.	Microbiology
6.	Pathology
7.	Pharmacology
8.	Anaesthesiology
9.	Community Medicine
10.	Dermatology & Venereology
11.	Medicine
12.	Obstetrics & Gynaecology
13.	Ophthalmology
14.	Orthopaedics
15.	Otorhinolaryngology
16.	Paediatrics
17.	Psychiatry
18.	Surgery
19.	Internship

## ANATOMY

Total duration of course is one year. It comprises of two semesters I and II. Each semester is of six months duration.

Course commences from 1<sup>st</sup> August every year and ends on 15 June following year.

The subject of anatomy is taught under the following heads:

1. Gross anatomy
2. Microanatomy
3. Embryology and Genetics
4. Neuroanatomy

Total number of teaching hours are approximately **650**.

### OBJECTIVES

At the end of the course, the student should be able to:

- Comprehend the normal disposition, inter-relationships, gross, functional and applied anatomy of the various structures in the body.
- Identify the microscopic structures of various tissues, and organs in the human body and correlate the structure with the functions as a prerequisite for understanding the altered state in various disease processes.
- Comprehend the basic structure and connections between the various parts of the central nervous system so as to analyze the integrative and regulative functions on the organs and systems. He/She should be able to locate the site of gross lesions according to the deficits encountered.
- To understand the basic principles of embryology including genetic inheritance and stages involved in development of the organs and systems from the time of conception till birth. The student should recognise the critical stages of normal development and the effects of common teratogens, genetic mutations and environmental hazards on it. He/She should be able to explain the developmental basis of the occurrence of major variations, abnormalities and congenital anomalies.

## **COURSE CONTENT**

### **1. Gross Anatomy**

Introduction to Anatomy, nomenclature, anatomical position, planes, tissues and movements.

#### **I. Osteology**

- (a) Names of the bones of the body and their position; classification of the bones with examples; general features of the bone and normal development; microscopic anatomy of bone; general pattern of blood supply; ossification of the bones of the limbs for age determination. X-rays of bones.
- (b) Process of repair of bone.

#### **2. Muscular System**

- (a) Classification and identification of the muscles of the body: main attachments, nerve supply and action(s), microscopic anatomy of muscles and the nerve terminations.
- (b) Details of attachments of the muscles; ultrastructural features of muscle; mechanism of the movement caused by the muscle/muscles and various forces exerted by them and their detailed action(s).

#### **3. Arthrology**

- (a) Definition and classification of joints, general features of different types of joints; detailed study of major joints of the limbs and movements performed at various joints in the body.
- (b) Microscopic anatomy of articular cartilage; maintenance of articular cartilages; blood supply and nerve supply of the joints.

#### **4. Cardio Vascular System**

- (a) Normal position, external features and parts of the heart; internal features of the chambers of heart, names of the blood vessels and venous drainage of the organs, structures and body as a whole, conducting system of heart, fibroskeleton of heart.
- (b) Variation(s), developmental anomalies of heart and blood vessels, valvular defects and their effects in pathogenesis of the anomalies.

#### **5. Respiratory System**

- (a) Position, parts, relations, blood supply of upper and lower respiratory tract. Pleura, its reflection, nerve supply, pleural recesses and their significance, bronchopulmonary segments, their importance.
- (b) Mechanism of respiration

#### **6. Digestive System**

- (a) Position, extent, parts, relations, blood supply, nerve supply, lymphatic drainage and sphincters of the gastrointestinal system.
- (b) Sphincteric action including functional implications.

## 7. Genito-Urinary System

- (a) Parts, position, relations, blood supply, nerve supply and lymphatic drainage of uterus, cervix, vagina, ovary, ovarian duct, testes, epididymis, seminal vesicle, ductus deferens, prostate, kidney, ureter, urinary bladder and urethra
- (b) Innervation of urinary bladder in detail

## 8. Endocrine System and Individual Endocrine Glands

- (a) Various endocrine glands, their location, relations, blood supply, nerve supply and lymphatic drainage.
- (b) Clinical manifestations of common endocrine disorders.

## 9. Nervous System and its components

- (a) Parts of nervous system, neuron meninges, nerve terminals, neuroglia, myelination, degeneration and regeneration, ventricles, CSF, spinal cord and its blood supply. Motor and sensory pathways, cranial nerves, thalamus, cerebellum, limbic and autonomic pathways. Functional cortical areas, motor and sensory cortex and their blood supply.

## 10. Special Sensory Organs

- (a) Gross Anatomy of :
  - (i) eye ball, extra ocular muscles their nerve supply and actions (s)
  - (ii) ear
  - (iii) nose
  - (iv) tongue, its musculature blood supply and lymphatic drainage.

## 11. Lymphatic System

- (a) Location of the major groups of the lymphnodes of the body and their drainage areas. Gross anatomy of the major lymphatics specially thoracic duct and its tributaries.

## 12. Surface Anatomy

- (a) Surface features of the body and projection of the outline of heart, its borders, surfaces and valves, lungs, their borders, fissures and hila, pleura, liver, kidneys and various abdominal and pelvic organs and important vessels and nerves

## 13. Cross Sectional Anatomy

Cross sections of thorax, abdomen and pelvis to understand the interrelationship of organs and structures.

## II. Microanatomy

Microscope and basic principles of microscopy, commonly used stains, basophilic and acidophilic staining reactions and their significance. Commonly encountered artifacts. Brief principle of electron microscopy and interpretation of ultrastructural features.

## GENERAL HISTOLOGY

**Cell** : detailed structure of cell and its components and their functional mechanisms.

### Four primary tissues

**Epithelium** : Microscopic characteristics, types, functions, distribution, basal lamina, cell junctions, specialization of the cell surface and their structural details and functions; metaplasia.

**Connective tissue** : Cells, fibers and their structural features and functions. Intercellular substances, amorphous ground substance, types of connective tissue (loose areolar tissue, dense connective tissue) and their distribution. *Specialized connective tissue* : different types of cartilages and their functions and distribution. **Bone** : Cells, bone matrix, structural features of compact and cancellous bone, their distribution and functions, ossification, blood supply of a long bone.

**Muscle** : General features, detailed structure of : skeletal muscle, and molecular mechanisms of contraction, innervation of skeletal muscle, neuromuscular junction, morphological and histochemical basis of classification into type I and type II muscle fibers and their significance, structural and functional characteristics of cardiac and smooth muscle; innervation of cardiac and smooth muscle.

**Nervous tissue** : Structural characteristics of a neuron, axon and dendrites. Different types of neurons and their specific structural and functional features and distribution. Axonal transport, synapse, morphological and functional characteristics of different types of synapses. Neuroglia : types, structure and functions, blood brain barrier. Brief cytoarchitecture of the central nervous system, regeneration in CNS with particular emphasis on stem cells. Sensory and autonomic ganglia, peripheral nerves, myelin and myelination, degeneration and regeneration in peripheral nerves.

### Histology of various organs/organ systems

**Exocrine glands** : Characteristics, simple and compound glands; types of secretions, modes of secretion, detailed structural features of a serous secreting cell and mucous secreting cell, serous and mucous acini, duct system, features of salivary glands, exocrine pancreas, sweat and sebaceous glands, mammary gland, bulbourethral gland etc.

**Circulatory system** : Structural features of heart; conducting and distributing arteries and arterioles; types of capillaries, their structural features and distribution and microcirculation, detailed structure of endothelium; structural characteristics of large and small veins and venules arterio-venous shunts, lymphatics.

**Respiratory system** : Structural features of nose, nasopharynx, larynx, trachea, principal bronchi, lung including intrapulmonary bronchi, bronchioles, alveolar ducts, atria, alveoli, blood-air-barrier. Functions of different parts of respiratory system.

**Skin and nerve-end-organs** : Thick, thin and hairy skin, cell renewal and pigmentation of skin, skin appendages, healing of skin wounds, sensory receptors of skin. Functions of skin.

**Immune system and lymphoid organs** : Lymphocytes, their subtypes and functions. Humoral and cell mediated immunity. Thymus, lymph nodes, spleen, tonsils and other mucous associated lymphoid follicles.

**Digestive system (GIT)** : General organization, oral cavity, lip, cheek, tongue, taste buds, associated salivary glands. Layers of tubular digestive tract, esophagus, stomach, small intestine, gastroesophageal junction, gastroduodenal junction, large intestine, anal canal and rectoanal junction. Liver, internal organization of liver, liver lobule, liver acinus, significance of zonation in liver acinus, liver sinusoids, detailed structure of hepatocyte, bile canaliculi, bile ducts, gall bladder, bile duct and pancreas.

**Endocrine glands** : Thyroid, parathyroid, Islets of Langerhan's gland, adrenal cortex and medulla, their structural details, functional mechanisms, hypophysis cerebri, cell types secretion and their functions, hypophyseal portal circulation, common endocrine disorders

**Urinary system** : Detailed microscopic structure of kidney, cortex, medulla, pyramids, medullary rays, cortical columns, glomerulus, nephron, glomerular filtration juxtaglomerular apparatus, its structural features and functions, renal interstitium, collecting ducts, renal sinus, minor and major calyces, microcirculation of kidney, histophysiology of the kidney, renal pelvis and ureters, urinary bladder and urethra.

**Female reproductive system** : Ovary, ovarian stroma, primary and secondary graafian follicles, functions of various constituents and structural details of graafian follicles, atretic follicles, corpus albicans. Oviducts, uterus, arterial supply of uterus, cyclic changes in uterine endometrium, fertilization, vagina, female external genitalia and mammary glands.

**Male reproductive system** : Testes, spermatogenesis, spermatozoon, cycle of seminiferous epithelium, sertoli cells, interstitial tissue Leydig cells, histophysiology of testes, epididymus, vas deferens, prostate, seminal vesicles, penis.

### III. Embryology

#### III. A General Embryology

- (a) Definition of embryology; gestation period: definition of gamete sperm, Ovum; gametogenesis, migration of primordial germ cells into gonadal ridge; spermatogenesis; structure of sperm, oogenesis; structure of ovum; growth of ovarian follicles, ovarian and uterine cycles.
- (b) Sperm in the male genital tract; sperm in the female genital tract, activation and capacitation of sperm in the female genital tract.

#### (c) *First Week of Development*

Definition and normal site and process of fertilisation, formation of zygote, cleavage division; formation of morula and blastocyst.

#### (d) **Second Week of Development**

Differentiation of embryoblast and trophoblast; changes in the embryoblast formation of bilaminar germ disc; changes in the trophoblast; formation of cytotrophoblast, syncytiotrophoblast, amniotic membrane, yolk sac, extra embryonic mesoderm and extra embryonic coelom and connecting stalk; formation of chorion, amniotic cavity, primary yolk sac cavity appearance of prochordal plate.

Implantation; formation of decidua, types of implantation and abnormal sites of implantation

#### (e) **Third Week of Development**

Appearance of primitive streak and primitive node; formation of intraembryonic mesoderm resulting in trilaminar germ disc; gastrulation formation of notochord, buccopharyngeal and cloacal membranes, paraxial, intermediate and lateral plate mesoderm, secondary yolk sac, intraembryonic coelom and allantoic diverticulum; derivatives of ectoderm, mesoderm and endoderm.

(f) ***Fourth To Eighth week of Development (Embryonic period)***

Formation of somites, neural tube, cephalocaudal folding, lateral foldings, body form, stomodeum, proctodeum, gut and vitelline duct; subdivisions of gut into foregut, midgut and hindgut.

***Development from third month to birth (Fetal period)***

(g) Maturation of tissues and organs and rapid growth of body.

(h) Estimation of age.

***Placenta***

(i) Formation of placenta and chorionic villi, decidua basalis; features and functions of placenta; placental circulation; abnormalities; placental barrier; placentome, types of placenta.

***Umbilical Cord***

(j) Formation of umbilical cord; features of umbilical cord.

***Amniotic Cavity***

(k) Amniotic cavity and membrane; amniotic fluid – functions, expansions of amniotic cavity and fusion with chorion; chorion laeve with decidua capsularis; decidua capsularis with parietalis; obliteration of chorionic and uterine cavities; function of fused foetal membranes to dilate cervical canal.

(l) Abnormalities; obliteration of chorionic and uterine cavities; abnormalities of chorion.

(m) Formation of twins and types of twins.

(n) Arrangement of foetal membranes. Conjoined twins.

***Teratology***

(o) Genetical and environmental factors as causative factors for congenital malformations.

(p) Mode of actions of teratogenes and critical periods.

**III.B Systemic Embryology**

(a) Development of the individual organs of digestive system, genital system, urinary system,, respiratory system, cardiovascular system. Nervous system, special sensory organs, endocrine glands and mammary gland.

(b) Developmental abnormalities of individual organs/systems, pathogenesis of the anomalies.

(c) Histogenesis of various organs.

(d) Development of skeletal system, muscular system and derivatives of coelomic cavities

(e) Development of face and the pharyngeal arches and the associated congenital anomalies.

**III.C Human Genetics**

(a) Cell, cell division, mitosis and meiosis, nucleus, DNA, chromosomes, classification, karyotype, chromosomal aberrations (Klinefelter, Turner and Down's Syndrome) Prenatal diagnosis for congenital abnormalities, sex determination.

(b) Pedigree chart, pathogenesis of chromosomal aberrations and their effects, recombinant DNA, genetic inheritance, genetic counselling, inborn errors of metabolism.



## **PRACTICALS**

### **Gross Anatomy**

Upper Limb: Dissection: Pectoral and scapular, axillary and shoulder region, arm, forearm.

Prosected parts: Joints, Palm and dorsum of hand.

Thorax : Dissection: Chest wall, mediastinum, pleura, lungs, heart.

Abdomen: Dissection: Anterior abdominal wall and inguinal region, external genitalia. Viscera and Posterior Abdominal wall and nerve plexus.

Pelvis: Dissection : Pelvic viscera, blood vessels and nerves.

Prosected Parts: Perineum including ischio-rectal fossa.

Lower Limb: Dissection: Gluteal region, front and back of thigh popliteal fossa, front back and lateral side of leg and dorsum of foot.

Prosected Parts: Sole of the foot and joints

Head & Neck: Dissection: Superficial and deep dissection of face and neck, orbit and eye ball. Submandibular region temporal and infratemporal fossa, cranial cavity, naso and oropharyngeal regions. Ear,. Larynx and pharynx.

### **Neuro Anatomy**

Gross specimen of full brain, meninges, spinal cord, prosected specimens to demonstrate visual system, auditory and vestibular pathways and major functional areas.

Stained sections of brain and spinal cord at various levels to demonstrate cranial nerve nuclei, ascending and descending tracts, thalamic nuclei and important functional areas.

### **Demonstrations**

- Bones of skull and vertebral column
- Brain and spinal cord
- Cross-sectional anatomy
- Radiological anatomy
- CT and MRI scan

### **Microscopic Anatomy**

- Routine and special stained slides of all the tissues and organs of body.
- Electronmicrographs to demonstrate filtration barrier of kidney, alveolar septum, tight junctions of capillaries and such relevant areas.

### **Developmental Anatomy**

- Models to demonstrate various stages of early foetus and different organ development.
- Slides of ovary and testis to show follicles and stages of maturation of spermatozoa: early chick and pig embryos to understand the development of tissues and organs from conception till term.

## Genetics

Demonstration of normal karyotype and common abnormal conditions including banding; Pedigree chart, syndromes and their clinical phenotype. Demonstration of various new techniques such as FISH.

### Skills

1. Demonstrate surface markings of important organs.
2. Localise important pulsation and the structures against which pressure can be applied in case of bleeding from a particular artery.
3. Demonstrate muscle testing and movements at joints.
4. Locate sites for : Lumbar puncture, sternal puncture, pericardial tapping, liver biopsy.
5. Locate veins for venae puncture.
6. Locate the site for emergency tracheostomy.
7. Locate the subcutaneous positions of large veins.

### Didactic Lectures:

Discussing the topic in detail in one hour lecture time.

### Practicals

Learning objectives are given to students before each session.

1. Dissection: is done by students on the cadavers and is being assisted/supervised by a team of teachers. Some prosected specimen/dissection are shown on Ultrascope which is telecasted on TV monitors fitted in dissection Hall.
2. Video tapes of some dissections are also shown on TV after the completion of dissection of the part/ region to recapitulate the details of the part/region dissected.
3. Cross sections of whole body and brain are shown to correlate with MRI. X-rays are shown after dissection of each region.
4. Self assessment MCQs are given at the end of dissection of each region and discussed with teachers in-charge.
5. Handouts are given at the end of completion of part/region to the students to recapitulate and remember the Gross anatomy, Neuroanatomy, Embryology and Histology.
6. In microanatomy, a preview of the slides is given on TV monitor in small groups to understand the structural details of tissue/structure/organ.
7. In embryology, the serial sections of early chick embryos and pig embryos are demonstrated to understand the sequence of events involved in development of various systems and to understand the developmental basis of occurrence of various congenital abnormalities. Computer assisted programs for understanding the normal development of organ/systems is also demonstrated. Specimen and models depicting normal development of system are shown.
8. In genetics, the phenotype photographs, karyotypes and pictures of various banding techniques are shown to understand the chromosomal abnormalities and various syndromes.
9. In Neuroanatomy, the stained sections at various levels of brain and spinal cord are shown on slides and computers to localize the cranial nerve nuclei and trace the origin, course and termination of ascending and descending tracts in order to understand the effects produced as a result of lesions.
10. Case studies of neural lesions are discussed to understand the location and level of lesions.
11. Demonstrations: Mainly the bones of the entire body, few dissected specimen are taught in small groups.

# BIOCHEMISTRY

## OBJECTIVES

### Knowledge

At the end of the course, the student should be able to: demonstrate his knowledge and understanding on the:

1. Molecular and functional organization of a cell, and sub- cellular components;
2. Structure, function and interrelationship of biomolecules and consequences of deviation from normal;
3. Basic and clinical aspects of enzymology and regulation of enzymatic activity;
4. Digestion and assimilation of nutrients and consequences of malnutrition;
5. Integration of the various aspects of metabolism, and their regulatory pathways;
6. Biochemical basis of inherited disorders and their associated sequelae;
7. Mechanisms involved in maintenance of body fluid and pH homeostasis;
8. Molecular mechanisms of gene expression and regulation, the principles of genetic engineering and their application in medicine;
9. Molecular concepts of body defence and their application in medicine;
10. Biochemical basis of environmental health hazards; and biochemical basis of cancer and carcinogenesis, principles of metabolism, and detoxication of xenobiotics.
11. Principles of various conventional and specialized laboratory investigations and instrumentation, analysis and interpretation of a given data; the ability to suggest experiments to support theoretical concepts and clinical diagnosis.

### Skills

At the end of the course, the student should be able to

1. Make use of conventional techniques/ instruments to perform biochemical analysis relevant to clinical screening and diagnosis
2. Analyze and interpret investigative data
3. Demonstrate the skills of solving clinical problems and decision making.

## **COURSE CONTENT**

### **Theory**

#### **Biological cell**

- (a) Architecture, compartmentation, cell membrane structure and functions; structure- function relationships.
- (b) Membrane transport.

#### **Biomolecules**

- (a) Function and classification of carbohydrates, lipids, protein and amino acids.
- (b) Stereoisomerism and chemistry of monosaccharides, amino acids, and fatty acids.
- (c) Structural organization and structure-function relationships of proteins. Hemoglobin and myoglobin, molecular mechanism of O<sub>2</sub> transport and storage. Molecular basis of sickle cell anaemia and thallemias.
- (d) Molecular mechanism of muscle contraction.
- (e) Plasma proteins, their functions and clinical significance.

#### **Enzymes**

- (a) Nomenclature, classification,
- (b) Kinetics, mechanism of enzymatic catalysis.
- (c) Factors influencing enzymatic catalyses, enzyme activators and inhibitors.
- (d) Regulation of enzyme activity,
- (e) Clinical enzymology, isoenzymes.

#### **Metabolic pathways, their regulation and metabolic interrelationships**

**Metabolism:** general concepts and characteristics of metabolic pathways.

##### **Carbohydrate metabolism**

- (a) Pathways of glucose metabolism: glycolysis
- (b) HMP shunt
- (c) Gluconeogenesis
- (d) Glycogenolysis, glycogenesis
- (e) Galactose and fructose metabolism
- (f) Glycogen storage disease
- (g) Inborn errors of glucose metabolism
- (h) Regulation of glucose metabolism.

**Amino acid metabolism**

- (a) General reactions, transamination, its metabolic and diagnostic significance
- (b) Disposal of amino acid nitrogen and detoxication of urea
- (c) Metabolic fate of amino acid carbon skeleton
- (d) Sulphur containing amino acids
- (e) In born errors of branched chain and aromatic amino acids
- (f) Important amino acid derivatives.

**Lipid metabolism**

- (a) Biosynthesis and degradation of fatty acids, phospholipids and triacylglycerols
- (b) Biosynthesis of cholesterol, chemistry and metabolism of lipoproteins.
- (c) Hyperlipoproteinemias
- (d) Lipid storage disease.
- (e) Ketone bodies: their synthesis, utilization and conditions leading to ketoacidosis, prostaglandin. **TCA cycle** and biological oxidation, prostanoids.

**Regulation of the metabolic pathways**

- (a) Carbohydrate, lipid and amino acid metabolism
- (b) Interlinks between these pathways.
- (c) Organ interrelationships in metabolism,
- (d) Blood glucose regulation, and its impairment in diabetes mellitus.
- (e) Metabolic adaptation in the fed state, fasting and prolonged starvation.
- (f) Metabolic derangements and adaptations in diabetes mellitus.

**Food assimilation and nutrition**

- (a) Digestive enzymes, their action on dietary carbohydrates, fats and proteins.
- (b) Absorption of glucose, amino acids and lipids.
- (c) Gastric, pancreatic and intestinal function tests, liver function tests.
- (d) Functions of dietary ingredients, the macro and micronutrients.
- (e) Fat soluble and water soluble vitamins
- (f) Malnutrition
- (g) Iron metabolism and heme synthesis.

**Hormones**

- (a) Molecular basis of hormonal action, signal transduction mechanisms.
- (b) Chemistry, functions and mechanism of action of hormones of the pituitary, thyroid, parathyroid, adrenals, pancreas, and gonads.
- (c) Biosynthesis of steroid hormones their functions and mechanism of action.
- (d) Pineal body

- (e) Endorphins and encephalins,
- (f) Calcium homeostasis.
- (g) Hormonal interplay in the regulation of metabolism.

### **Molecular Biology**

- (a) Nucleic acids: DNA and RNA structure
- (b) DNA Replication,
- (c) DNA Transcription
- (d) Post-transcriptional processing.
- (e) Translation of genetic code
- (f) Regulation of gene expression and protein synthesis inhibitors of protein synthesis.
- (g) DNA repair mechanisms,
- (h) Applied aspects of purine and pyrimidine metabolism
- (i) Genetic Engineering: Recombinant DNA technology
- (j) DNA and diagnostics
- (k) DNA repair mechanisms and related disorders
- (l) Telomers, telomerases
- (m) Inhibitors of DNA replication, apoptosis

### **pH, Buffer, physiological buffer systems**

- (a) Regulation of blood pH, acidosis, alkalosis,
- (b) Renal functions tests.

### **Immunology**

- (a) Reticuloendothelial system, components and functions of the innate and adaptive immunity.
- (b) Role of T and B lymphocytes, antigen presentation
- (c) Induction of immune response
- (d) Cell mediated immune response
- (e) Immunoglobulin structure and functions
- (f) Humoral immune response
- (g) Fate of antigen antibody complex,
- (h) Complement system
- (i) Generation of antibody diversity,
- (j) Hypersensitivities
- (k) Immunoregulation, autoimmunity, tolerance
- (l) HLA, disease association & transplantation
- (m) Immunological techniques, application in medicine (vaccines, immunotherapy, immunoassays and immunodiagnostics).

## **Environmental biochemistry, cancer and cancer makers**

- (a) Xenobiotics, interaction with biomolecules, effects, metabolism, detoxication,
- (b) Biochemical characteristics of cancer
- (c) Environmental pollutants and carcinogenesis.

## **PRACTICALS**

1. Laboratory Instrumentation.
2. Protein fractionation, denaturation, separation of proteins and amino acids.
3. Colour reactions of amino acids and proteins.
4. Estimation of blood analytes: glucose, total cholesterol and HDL cholesterol, uric acid, electrolytes, urea.
5. Cerebrospinal fluid analyses.
6. Gastric juice analyses.
7. Urine analyses.
8. Amniotic fluid analyses.
9. Enzymes: amylase, lactate dehydrogenase and alkaline phosphatase
10. Liver function tests
11. Renal function tests.
12. Gel electrophoresis of DNA.
13. Immunodiffusion techniques, RIA and ELISA
14. Case-oriented discussions (enzymes, metabolites, function tests)

Biochemistry is taught in two semesters in the 1st year of the MBBS curriculum.

1st Semester : Aug-December

2nd Semester : Jan-June

## **TEACHING-LEARNING METHODOLOGY**

1. Didactic lectures: To facilitate learning of terminology, principles and concepts. Books and resource material are suggested to encourage self- directed learning.
2. Tutorials; Two hours/week. Problem based small group discussions, questions-answer sessions, revision and reinforcement of difficult concepts in tutorial hours. The purpose is to inculcate skills of reasoning, meaningful approaches to learning and facilitate understanding of the subject.
3. Laboratory exercises: (Biochemistry practicals) three hours/week: a) to substantiate and clarify theoretical concepts with experimental evidence b) to develop skills of performing basic biochemical tests important in clinical investigations c) to develop familiarity with biochemical laboratory instrumentations techniques.
  - (1) Practical bench work
  - (2) Demonstration
  - (3) Analyses and interpretation of data
  - (4) Discussions on the practicals with the help of clinical and scientific problems

# PHYSIOLOGY

## OBJECTIVES

### Knowledge

At the end of the course the student will be able to:

1. Explain the normal functioning of all the organ systems of the body and their interactions.
2. Evaluate the contribution of each organ system to the maintenance of homeostasis.
3. Elucidate the physiological aspects of normal growth and development.
4. Prescribe the physiological response and adaptations to environmental stresses.
5. List the physiological principles underlying pathogenesis and treatment of disease.

### Skills

At the end of the course the student will be able to:

1. Perform experiments designed either primarily for the study of physiological phenomena or for assessment of function.
2. Analyse and interpret experimental/investigative data critically.
3. Distinguish between normal and abnormal data derived as a result of tests which he/she has performed and observed in the laboratory.

## COURSE CONTENT

### Lectures

#### General Physiology

1. Mutual introduction of dramatis personae in the teaching learning process
2. Know thy institute



3. Physiology: what and why? Homeostasis: an evolutionary point of view
4. Characteristics of control systems
5. Looking back & forth
6. Reading efficiently

### **Nerve–Muscle**

1. Physicochemical properties of cell membrane
2. Cell membrane: permeability & transport
3. Principles of bioelectricity
4. Genesis of resting membrane potential
5. Action potential
6. Properties of nerve-fibres
7. Functional anatomy of neuromuscular junction
8. Neuromuscular transmission
9. Muscle proteins – (Biochemistry)
10. Excitation – contraction coupling
11. Contraction kinetics of skeletal muscles
12. Smooth muscle
13. Injury & repair of nerves and muscles
14. Energetics of nerve & muscle
15. Work Physiology

### **Blood**

1. Functions of plasma proteins
2. Principles of hemopoiesis
3. Regulation of erythropoiesis
4. Destruction of red cells: Jaundice
1. Anemia
5. Regulation of WBC production
6. Functions of WBC
7. Functions of platelets
8. Hemostasis
9. Blood groups
10. Physiological basis of transfusion medicine

### **Respiratory System**

1. Introduction to respiratory system
2. Lung volumes and capacities

3. Mechanics of respiration – I
4. Mechanics of respiration – II
5. Composition of respired air: pulmonary ventilation
6. Exchange of gases in the lungs
7. Ventilation – perfusion ratio
8. O<sub>2</sub> carriage, O<sub>2</sub>–dissociation curve
9. CO<sub>2</sub> carriage, CO<sub>2</sub>–dissociation curve
10. Neural regulation of respiration
11. Chemical regulation of respiration
12. Hypoxia, cyanosis and dyspnoea
13. Special features of pulmonary circulation
14. Artificial respiration Artificial respiration
15. Therapeutic use of oxygen .

### **Cardiovascular System**

1. Introduction to CVS
2. Properties of cardiac muscle
3. Action potential and spread of impulse in the heart
4. E-C coupling in the myocardium
5. ECG
6. Pressure changes in the heart. Cardiac cycle
7. Functional basis of heart sounds and murmurs
8. Neural regulation of cardiac activity
9. Regulation of heart rate
10. Intrinsic regulation of heart's action. Cardiac output
11. Cardiac output: measurement and regulation
12. Nutrition and metabolism of heart
13. Exercise physiology
14. General principles of hemodynamics
15. Cardiovascular reflexes
16. Neural control of circulation
17. Special features of cerebral circulation
18. Special features of circulation in skeletal muscles and skin

### **Gastrointestinal System**

1. Introduction to G.I. Physiology: general organization of G.I. tract
2. Mastication and deglutition

3. Gastric secretion
4. Regulation of gastric secretion
5. Pathophysiology of peptic ulcer
6. Biliary and pancreatic secretions
7. Physiology of colon
8. Pathophysiology of diarrheal disease

## **Nutrition**

1. Introduction to nutrition. RMR
2. Carbohydrates and dietary fiber
3. Proteins
4. Fats
5. Recommended dietary allowances
6. Diet during pregnancy and lactation
7. Diet during infancy and childhood

## **Environmental Physiology**

1. Introduction to environmental physiology
2. Body temperature regulation
3. Man in cold environment
4. Man in hot environment
5. Hypothermia and its clinical applications
6. Physiological responses to high altitude
7. Physiological responses to high atmospheric pressure

## **Reproduction**

1. Introduction to reproductive system
2. Male reproductive physiology
3. Female reproductive physiology
4. Hypothalamic – pituitary – gonadal axis
5. Puberty
6. Pregnancy
7. Parturition and lactation
8. Reproductive ageing

## **Kidney**

1. Renal hemodynamics and glomerular filtration
2. Renal tubular function – I

3. Renal tubular function – II
4. Regulation of renal function
5. Physiological basis of renal function tests
6. Micturition

## **Neurophysiology**

### ***General***

1. Introduction to neurophysiology I
2. Introduction to neurophysiology II
3. CSF
4. Neuroglial cells
5. Synaptic transmission
6. Properties of synaptic transmission
7. Neurotransmitters

### ***Sensory system***

1. Coding of sensory information
2. Functional organization of ascending sensory pathways
3. Thalamus
4. Sensory cortex
5. Perception of sensory stimuli
6. Physiology of pain

### ***Motor system***

1. Characteristics and properties of reflexes
2. Functional organization of motor system – I
3. Functional organization of motor system – II
4. Brain stem reflexes, stretch reflexes and tendon reflexes
5. Basal ganglia
6. Cerebellum
7. Vestibular neck reflexes: maintenance of equilibrium
8. Localizing the level of lesion in neurological disease

### ***Visceral and motivational system***

1. Autonomic nervous system
2. Hypothalamus
3. Limbic system and emotions

***EEG, sleep and higher nervous functions***

1. Electroencephalography
2. Sleep and wakefulness
3. Learning and memory – I
4. Learning and memory – II
5. Speech

***Special Senses***

1. Functional anatomy of eye
2. Functions of retina: photoreception
3. Functions of retina: colour vision and electroretinography
4. Central mechanisms of vision and visual perception
5. Functional anatomy of ear: impedance matching
6. Organ of Corti: peripheral auditory mechanism
7. Auditory pathway
8. Central auditory mechanism and auditory perception
9. Olfaction
10. Physiology of taste

**Yoga**

1. Introduction to yoga
2. The yogic practices
3. Meditation: principles and practice
4. Physiological effects of yoga
5. Yoga in health and disease

**Practicals****Blood**

1. Preparation and examination of peripheral blood smear and determination of differential leucocyte count
2. Determination of total red blood cell count
3. Determination of total leucocyte count
4. Determination of platelet count
5. Determination of reticulocyte count
6. Determination of eosinophil count
7. Determination of osmotic fragility of erythrocytes
8. Determination of erythrocyte sedimentation rate, packed cell volume and calculation of the absolute values

9. Determination of hemoglobin concentration of blood
10. Determination of ABO and Rh blood groups
11. Determination of bleeding time, clotting time and plasma prothrombin time
12. Examination of bone marrow smear
13. Estimation of blood volume by dye dilution technique

### **Nerve and Muscle**

1. Study of salient features of electromyography
2. Estimation of conduction velocity of human ulnar nerve and calculation of conduction velocity
3. Study of phenomenon of human fatigue : (i) Mosso's ergograph , and (ii) Handgrip dynamometer/ ergograph for isometric work
4. To measure the mechanical efficiency at different grades of exercise
5. Study of excitable and contractile properties of a nerve-muscle preparation. Demonstration of (i) effect of sub-threshold, threshold, and supra-threshold stimuli, (ii) Isotonic contraction, (iii) Effect of two or more stimuli, (iv) Isometric contraction, (v) Length-tension relationship
6. Demonstration of work performed by skeletal muscle in vitro under (i)After loaded conditions, and (ii) Free loaded conditions
7. Demonstration of muscle fatigue and neuromuscular transmission in an amphibian model
8. Demonstration of compound action potential in a frog's sciatic nerve
9. Determination of strength-duration curve in frog's nerve and muscle

### **Cardiovascular System**

1. Recording and analysis of 12 lead electrocardiogram and to measure the mean electrical axis of heart
2. Determination of the effect of posture on blood pressure
3. Determination of physical fitness of a subject using screening tests
4. Measurement of blood flow in the forearm by venous occlusion plethysmography and to demonstrate the effect of (a) Exercise, (b) Arterial occlusion, and (c) Temperature
5. Clinical examination of the human cardiovascular system (CVS)
6. Demonstration of the properties of cardiac muscle in the frog
7. Study of the factors controlling inotropic and chronotropic functions in isolated perfused frog's heart
8. Demonstration of exercise stress test

### **Respiration**

1. Determination of various lung volumes and lung capacities and calculation of maximum voluntary ventilation (MVV) and forced expiratory volume (FEV) by spirometry
2. Recording of chest movements by a stethograph and to study the effects of Speech, swallowing, coughing, breath-holding and hyperventilation

3. Examination of human respiratory system
4. Measurement of respiratory dead space

### **G.I.T. and Metabolism**

1. Determination of resting metabolic rate in human
2. Clinical examination of the abdomen
3. Study of the movements of isolated segment of mammalian small intestine and the effects of:  
(i) ions, (ii) neurotransmitters, and (iii) cold in vitro

### **Reproduction**

1. Changes in vaginal exfoliation cytology and cervical secretion during different phases of reproductive cycles in human and in rat.
2. Pregnancy tests.
3. Determination of sperm count, motility and morphology in a human Sample

### **Environmental physiology**

Study of the effects of exposure to hot and cold environment on human Subject

### **Neurophysiology**

1. Examination of nervous system including cranial nerves
2. Human electroencephalography: Methods of recording and identification of different types of EEG waves.
3. Ingestive behaviour and its nervous control
4. To determine the reaction time in a human subject
5. Demonstration of non-invasive assessment of autonomic nervous functions

### **Special senses**

1. Determination of visual acuity
2. Clinical assessment of colour vision
3. Perimetry: Mapping of visual field
4. Blind spot in the field of vision
5. Demonstration of the principles of optics in the eye using a model of eye
6. Demonstration of audiometry
7. Demonstration of vestibulo-ocular reflex (V.O.R.) by caloric stimulation

## FORENSIC MEDICINE & TOXICOLOGY

The broad goal of the teaching of undergraduate students in Forensic Medicine is to produce a physician who is well informed about medicolegal responsibilities in practice of medicine. He/She will also be capable of making observations and inferring conclusions by logical deductions to set enquiries on the right track in criminal matters and connected medicolegal problems. He/She acquires knowledge of law in relation to medical practice, medical negligence and respect for codes of medical ethics.

### OBJECTIVES

At the end of the course in the forensic medicine, the MBBS student will be:

- 1 Able to understand the basic concept of the subject and its importance.
- 2 Aware of inquest, legal and court procedures applicable to medico-legal and medical practice.
- 3 Able to perform medicolegal postmortem/autopsy findings and results of other relevant investigations for logical conclusion and framing the opinion on cause, manner and time since death.
- 4 Able to reserve and despatch relevant various articles, trace evidences including viscera in poisoning cases in medicolegal cases/ autopsy examination and handing over the same to appropriate agencies.
- 5 Able to identify the medicolegal cases, carryout medical examination in such cases and prepare medicolegal report as per the law of the land.
- 6 Aware of code of ethics, duties and rights of medical practitioner, duties towards patients and community, punishment on violation of code of ethics, various forms of medical negligence, duties towards his professional colleagues.
- 7 Able to diagnose and manage the cases of acute and chronic poisoning and can carryout medicolegal duties.
- 8 Aware of general principles of analytical, environmental, occupational toxicology including toxicovigilance and predictive toxicology.
- 9 Aware of latest advances in Forensic Medicine & Toxicology and their medicolegal importance.



## **COURSE CONTENT**

### **A – FORENSIC MEDICINE**

#### **1. FORENSIC PATHOLOGY**

Definition of Forensic Medicine, State Medicine, Legal Medicine and Medical Jurisprudence. History of Forensic Medicine.

1. Criminal procedure code, Criminal cases, Civil cases, Definition of Inquest , Different types of inquest procedures police inquest, magistrate’s inquest. Cognizable and non cognizable offences, Different types of courts in India and their powers – Supreme court, High Court, Session Court, Magistrate’s court. Court procedures: Summons,oath, affirmation,conduct money, types of witnesses, types of examination in court. Examination in chief, Cross examination, Re-examination, court questions, Evidence – Oral, Documentary, Medical evidence, Medical Certificate, Dying dclaration, Dying deposition, Conduct of a doctor in witness box and Examination of dead body at the scene of crime.
2. Definition of death, Types of death-Somatic/Clinical/Cellular, Molecular and Brain death including cortical death and Brainstem death, Natural and Unnatural death, Suspended animation Moment of death, Modes of death – Coma, Syncope and Asphyxia, Presumption of death and Survivorship and Sudden death.
3. Description of signs of death. Post-mortem changes after death –cooling of dead body, postmortem lividity, rigor mortis, cadaveric spasm, heat and cold stiffening, putrefaction, mummification, adipocere formation maceration and preservation of dead bodies.
4. Estimation of time since death on postmortem examination.
5. Examination of mutilated bodies or fragments, bundle of bones and exhumation.
6. Definition of postmortem examination, Different types of autopsies, HIMS and objectives of postmortem examination, Legal requirements to conduct postmortem examination, Procedure to conduct medicolegal postmortem examination, obscure autopsy, examination of clothing, preservation of viscera on postmortem examination for chemical analysis and other medicolegal purposes, postmortem artefacts.
7. Definition and classification of asphyxia, medico-legal interpretation of postmortem findings in asphyxial deaths.
8. Definition and types of hanging and strangulation. Description of clinical findings, causes of death, postmortem findings and medico-legal aspects of death due to hanging and strangulation. Examination and despatch of ligature material.
9. Definition, pathophysiology, clinical features, postmortem findings and medicolegal aspects of traumatic asphyxia, obstruction of nose & mouth, suffocation, sexual asphyxia.
10. Definition, types, pathophysiology, clinical features, postmortem findings and medicolegal aspects of drowning, diatom test, Gettler test.
11. Clinical features, postmortem finding and medico legal aspects of injuries due to physical agents-heat (heat-hyper-pyrexia, heat stroke, sun stroke, Heat exhaustion (Prostration), heat cramps (miner’s cramp)),cold (hypothermia, Frostbite, trench foot, Immersion foot), lightning,electrocution and radiations.

12. Clinical features, postmortem findings and medicolegal aspects of death due to starvation and neglect. Types of injuries, clinical features, pathophysiology, postmortem findings and medicolegal aspects in cases of burns and scalds.
13. Definition of infanticide, foeticide and stillbirth. Signs of intrauterine death, Signs of live birth, viability of foetus, age determination of foetus, demonstration of ossification centres, precipitate labour, Haase's rule, Hydrostatic test, maceration, Sudden infants death syndrome, Munchausen's syndrome by proxy.

## **2. CLINICAL FORENSIC MEDICINE**

14. Establishment of identity of living persons – Definition of Corpus Delicti, Race, sex, religion, complexion, stature, age determination using morphology, teeth-eruption, decay, bite marks, bones-ossification centres, medicolegal aspects of age. Foetal age determination, Identification of criminals, unknown persons, dead bodies from the remains-hairs, fibers, teeth, anthropometry, dactylography, foot prints, scars, tattoos, poroscopy and Superimposition.
15. Definition and classification of injuries, Various types of injuries. Abrasion, bruise, laceration, stab wound, incised wound, chop wound, defence wound, self inflicted/fabricated wounds and their medicolegal aspects.
16. Description of regional injuries to head (Scalp wounds, fracture skull, Intracranial haemorrhages, Coup and contrecoup injuries), Neck, Chest, Abdomen, Limbs, Genital organs, Spinal cord and skeleton, Vehicular injuries – Primary and Secondary impact, Secondary injuries, crush syndrome, railway spine, reconstruction of scene of crime.
17. Definition of Injuries, Assault and Hurt. IPC pertaining to injuries. Accidental, Suicidal and Homicidal Injuries. Types of Injuries – Simple, Grievous and Dangerous. Different types of weapons, Dangerous weapons and their examination. Antemortem and Postmortem Injuries, Medico-legal aspects of injuries. Factors influencing, Infliction of Injuries and Healing, Different legal questions, examination and certification of wounds, Wound as a cause of death: Primary and Secondary. Dowry death. Workman's Compensation Act.
18. Firearm injuries. Classification of fire-arms. Structure and components of various firearms, description of ammunition propellant charge and mechanism of fire-arms, Various terminology in relation of firearm – calibre, range, choking. Description of different types of cartridges and bullets.
19. Description of wound ballistic, blast injuries and their interpretation. Preservation and despatch of trace evidences in cases of firearm and blast injuries. Various test related to confirmation of use of firearms.
20. Definition and types of sexual offences, Definition of rape. Section 376 IPC, Examination of the victim of an alleged case of rape, Examination of the accused of an alleged case of rape, preparation of report and framing the opinion in rape cases, preservation and despatch of trace evidences in cases of rape. Adultery, Unnatural Sexual offences Sodomy, Examination of accused and victim, preparation of report and framing of opinion, preservation and despatch of trace evidences in cases of sodomy, incest, lesbianism, buccal coitus, bestiality, indecent assault. Sexual perversions. Fetichism, transvestism, voyeurism, sadism necrophagia, masochism, exhibitionism, frotteurism, necrophillia.

21. Definitions of Impotence, Sterility, Frigidity, Sexual Dysfunction, Premature Ejaculation, Causes of Impotence and sterility in male and female, Sterilization, Artificial Insemination, Surrogate mother, Delhi Artificial Insemination act 1995.
22. Definition of Virginity and defloration, anatomy of male and female genitalia, Hymen and its types, Medicolegal importance of hymen, Medicolegal importance of pregnancy, diagnosis of pregnancy, Superfoetation, superfecundation, Definition of Legitimacy and its medicolegal importance, Disputed paternity and maternity, Medicolegal aspects of delievery, Signs of delievery, Signs of recent and remote delievery in living and dead.
23. Definition, Classification and complication of abortion, MTP act 1971, Methods of procuring criminal abortion, Evidences of abortion-Living and Dead, Duties of doctor in cases of abortion.
24. Battered baby syndrome.

### **3. MEDICAL JURISPRUDENCE**

25. Medical council of India, state medical councils- Their functions and disciplinary control. Laws in relation to medical practice, duties of medical practitioner towards the patients and society. Indian Medical Register, rights privileges of medical practitioner, penal erasure, infamous conduct, disciplinary committee, warning notice & euthanasia.
26. Code of medical ethics, unethical practices, dichotomy, consumer protection act , Prenatal diagnostic techniques act, Human organ transplantation act, ESI act, medicolegal issues in relation to family violence, Violation of human rights, NHRC and doctors, Doctors and media, ethics related to HIV patients.
27. Malpractice- Civil, Criminal and ethical
28. Consent, kinds of consent, informed consent, negligence, vicarious liability, the doctrine of res Ipsa Loquitur, Contributory Negligence, Therapeutic Privilege, Rules of Consent, Malingering, Therapeutic Misadventure, corporate negligence, Professional negligence, Professional Secrecy, Human Experimentation, IPC related to medical Practice, Products liability, Medical Indemnity Insurance, Medical records.

### **4. FORENSIC PSYCHIATRY**

29. Definition, Various types of mental disorder, Lucid interval, Classification of mental disorder, mental subnormality, Diagnosis of Insanity and Feigned insanity, Restraint, admission and discharge of Insane in accordance to Mental Health act 1994, Mental disorder and responsibility- Civil and Criminal responsibility, Testamentary Capacity, Mc Naughten's rule.

### **5. FORENSIC SCIENCES**

30. Definition of DNA fingerprinting, Techniques of DNA Fingerprinting, Application of DNA profiling in forensic Medicine, HLA typing.
31. Locard's exchange principle, Examination, preservation, despatch and identification of blood, Seminal stains (Physical, microscopic, chemical and serological test, blood grouping) and its medicolegal aspects, Saliva, vaginal fluid, faecal and urinary stain, examination of skin, nail tooth pulp and other body fluids group specific substances, hazards of blood transfusion.

## B. TOXICOLOGY

### 1. GENERAL TOXICOLOGY

History of Toxicology, Definition of Toxicology, Forensic Toxicology, Clinical toxicology and Poison, Laws in relation to poisons, Medicolegal aspects of poisons, Classification of poisons, Toxicokinetics and Toxicodynamics, diagnosis of poisoning in living and dead, General principles of management of poisoning, Antidotes and its types, Medicolegal autopsy in cases of poisoning, preservation and despatch of viscera for chemical analysis.

### 2. CLINICAL TOXICOLOGY

Types of poison, Clinical signs and Symptoms, diagnosis, management and medicolegal aspects of :

1. Corrosive poisons – sulphuric acid, phenol ,oxalic acid, nitric acid, hydrochloric acid, organic acids and alkalies.
2. Irritant non metallic poisons- Phosphorus, Halogens, Organophosphorus, chlorinated hydrocarbons, miscellaneous preparation & mechanical irritants.
3. Agricultural poisons- Organophosphorous, Organochlorine. Classification and description of common insecticides and pesticides used in India
4. Metallic poison - arsenic, lead, iron, copper, zinc, thallium.
5. Animal poisons – snake bite, scorpion bite , wasp, bee, cantherides & toxic fishes.
6. Somniferous poisons – opium & its derivatives, synthetic preparations, pethidine & codeine.
7. Deliriant poisons – Dhatura , hemlock, cannabis, LSD, muscaline & cocaine .
8. Spinal & peripheral nerve poisons – strychnine, curare & domestic poisons – kerosene, cleansing agents, disinfectants, household medicines.
9. Barbiturate poisoning, drug abuse & common drug overdoses.
10. Vegetable poisons – abrus, ricinus, croton, ergot, capsicum, camphor, argemone, lathyrus & calotropis.
11. Describe and examine Alcohol poisoning (ethyl & methyl alcohol) and drunkenness, its medico-legal aspects & benzodiazepine poisoning.
12. Cardiac poisons – HCN, aconite, tobacco, quinine, digitalis and oleander.
13. Asphyxiant poisons – carbon monoxide, , carbon dioxide, hydrogen sulphide, phosgene and phosphine.
14. Definition of food adulteration. Names of common adulterants and general methods of detection for food adulterants, Common food poisonings- Botulism, Chemical Poisoning, Poisonous Mushrooms and epidemic dropsy.

### 3. ENVIRONMENTAL TOXICOLOGY

15. Description of toxic pollution of environment, its medico-legal aspects & toxic hazards of occupation and industry.
16. Description and medico-legal aspects of poisoning in Workman's Compensation Act.

### 4. ANALYTICAL TOXICOLOGY

17. General principles of analytical toxicology and its application in management , prevention and control of poisoning.
18. Basic principles of functioning of Gas Liquid Chromatography, Thin Layer Chromatography, Atomic Absorption Spectrophotometer, Spectrophotometer, Neutron Activation Analysis, Mass spectrometry, alcometer.

### PRACTICALS IN FORENSIC MEDICINE & TOXICOLOGY

1. Preparation of a Medico-legal report of an injured person due to mechanical violence.
2. Preservation and despatch of the exhibits in a suspected case of poisoning.
3. Estimation age of a person for medico-legal and other purposes.
4. Conduct & prepare postmortem examination report in a case of suspected poisoning and to preserve & dispatch viscera for chemical analysis.
5. Conduct & prepare postmortem report in a case of death due to violence of any nature - road accident, fall from height, assault, factory accident, electrocution, burns & accident due to any other cause, fire arm injury, asphyxia, natural death & medical negligence. At least 10 postmortem reports should have been written by the student.
6. Demonstration, interpretation and medico-legal aspects from examination of hair (human & animal) fibre, semen & other biological fluids.
7. Demonstration & identification of a particular stain is a blood and identification of its species origin.
8. Identification ABO & RH blood groups of a person.
9. Examination & drawing opinion from examination of skeletal remains.
10. Identification & drawing medico-legal inference from various specimen of injuries e.g. contusion, abrasion, laceration, firearm wounds, burns, head injury and fracture of a bone .
11. Identification & description of weapons of of medicolegal importance commonly used e.g. lathi, knife, kripan, axe, gandas, gupti, farsha, dagger, bhalla, razor & stick
12. Description of the contents and structure of bullet & cartridges used & medico-legal interpretation drawn.
13. Estimation of age of foetus by postmortem examination.
14. Examination & preparation of report of an alleged accused in a rape/unnatural sexual offence.
15. Examination & preparation medico-legal report of a victim of sexual offence/unnatural sexual offence.
16. Examination and preparation of medico-legal report of a drunk person.
17. Demonstration of the common instrument used in analysis of poison & DNA profile – TLC, GLC, AAS.
18. Identification & drawing of medico-legal inference from common poisons e.g. Dhatura, castor, cannabis, opium, aconite copper sulphate, pesticides compounds, marking nut, oleander, Nux

vomica, abrus seeds, snakes, capsium, calotropis, lead compounds & tobacco.

19. Examination & preparation of a medico-legal report of a person brought for medical examination in cases pertaining to police, judicial custody or referred by court of law and violation of human rights as requirement of NHRC.
20. Identification & drawing of medico-legal inference from histopathological slides of Myocardial infarction pneumonitis, tuberculosis, brain infarct, liver cirrhosis, brain hemorrhage, bone fracture, pulmonary odema, brain odema, soot particles, diatoms & wound healing.

# MICROBIOLOGY

The goal of teaching microbiology to undergraduate medical student is to provide an understanding of the infectious disease in order to deal with the etiology, pathogenesis, laboratory diagnosis, treatment and control of infections.

## OBJECTIVES

### (A) Knowledge

At the end of the course, the student shall be able to:

1. state the infective micro-organisms of the human body and describe the host parasite relationship
2. list pathogenic micro-organisms and describe the pathogenesis of the diseases produced by them
3. state or indicate the modes of transmission of pathogenic and opportunistic organisms and their sources, including insect vectors responsible for transmission of infection
4. describe the mechanisms of immunity to infection
5. acquire knowledge on suitable antimicrobial agents for treatment of infection and scope of immunotherapy and different vaccine available for prevention of communicable diseases
6. apply methods of disinfection and sterilization to control and prevent hospital and community acquired infections
7. recommend laboratory investigations regarding bacteriological examination of food, water, milk and air

### (B) Skills

At the end of the course, the student shall be able to :

1. plan and interpret laboratory investigations for the diagnosis of infectious diseases and to correlate the clinical manifestations with the etiological agents
2. identify the common infectious agents with the help of laboratory procedures and use antimicrobial sensitivity tests to select suitable antimicrobial agents
3. use the correct method of collection, storage and transport of clinical material for microbiological investigations

## **COURSE CONTENT**

### **III SEMESTER**

#### **1. Introduction to Microbiology**

- (i) Natural history of microbial diseases.
- (ii) Unique differentiating features of eukaryotes and prokaryotes
- (iii) Source and spread of microbes
- (iv) Rationale for classifying microbes into bacteria, fungi viruses, parasites.

#### **2. Introduction to Bacteriology**

- The nature of bacteria
- Morphological differences
- Growth requirement
- Nomenclature and classification
- Enumeration of bacteria responsible for certain primary diseases.

#### **3. Bacterial Staining and Cultivation**

- Microscopy : types and principles
- Staining : principles
- Media for growth / bacterial colony
- Familiarization with materials used

#### **4. Common Tests for Bacterial identification**

- Various types of staining such as simple, differential staining; different procedures of staining and their principles
- Motility testing
- Common sugar fermentation and other biochemical tests such as Catalase / Coagulase/ citrate utilization/ nitrate reduction / urease/ PPA/ OF/ Indole etc.
- Sensitivity testing

#### **5. Introduction to parasitology**

- Biology of protozoa
- Protozoan parasites causing human infection
- Medically important helminths
- Ectoparasites

#### **6. Introduction to Virology**

- The nature and properties of viruses
- Classification of viruses
- Morphology



**7. Laboratory Diagnosis of Viral Infection**

- Brief appraisal of pathogenicity of viruses
- Culture methods
- Cytopathic effects
- Inclusion bodies
- Animal inoculation
- Serological test (CFT, HAI, neutralisation)

**8. Introduction to Mycology**

- Nature of fungi : basic structures and classification
- Superficial mycoses
- Subcutaneous mycosis
- Systemic fungal infections with opportunistic mycosis

**9. Common Laboratory Methods for Diagnosis of Fungal Infections**

- (i) KOH preparation with principles
- (ii) Lactophenol cotton blue preparation
- (iii) Negative staining and procedures
- (iv) Special staining and procedures
- (v) Culture of fungi
- (vi) Serodiagnosis

**10. Collection of Transport of Samples**

- Collection of clinical samples
- Transport of various appropriate clinical samples.
- Transport media
- Description of container with contents or no contents.
- Preliminary processing of clinical samples

**11. Host-Parasite relationship**

- Presence of normal flora
- Enumeration and explanation of various host-parasite interaction
- Mechanism of pathogenesis adhesion/ colonisation/ virulence and toxigenicity
- Host response
- Koch's postulates

**12. Bacterial AND Viral Genetics**

- Structure and replication of bacterial DNA
- Plasmids
- Transfer of genetic materials

- Mutations
- Viral replication
- Interactions among viruses (recombination, genetic reactivation, complementation etc).
- Epidemiology of viral infection
- Recombinant DNA technology

### 13. **Immunity to infection**

- Normal immune system
- Innate Immunity
- Antigens – presentation and association in immunity
- Immunoglobulins and their role in immunity
- Cell mediated immunity and their role
- Hypersensitivity
- Immunodeficiency
- Tolerance

### 14. **Immunodiagnosis**

- Antigen-antibody reactions in infectious diseases and diagnostic tests based on these

### 15. **Vaccines**

### 16. **Sterilisation and disinfection**

- Principles
- Various methods
- Demonstration of equipments and agents used in sterilization
- Visit to CSSD

### 17. **Bacteriology of water and air**

Infections of Gastrointestinal Tract

### 18. **Microorganisms associated with**

gastrointestinal infections.

(Bacteria, parasites, viruses and fungi).

### 19. **Gastrointestinal infections caused by parasites**

#### 19a. Amoebiasis

- Entamoeba spp
- Naegleria spp
- Acanthamoeba spp

#### 19b. Amoebiasis (Micro, Gastro, Surg, Paeds)

#### 19c. Other intestinal protozoal infections (Micro, Gastro, Paeds)

## **PRACTICAL SCHEDULE FOR III SEMESTER**

1. **Microscopy and micrometry**
  - Introduction to microscopes
  - Focussing slides under low/ high power and oil immersion
  - Principles and demonstration of various types of microscopes
2. **Direct demonstration of bacteria by staining**
  - Gram staining
  - Albert's staining
  - Acid fast staining
3. **Motility tests and biochemical tests for bacterial identification**
  - Hanging drop method for motility testing
  - Important biochemical tests : principles and interpretation
4. **Laboratory diagnosis of viral infections**
  - Collection and transport of samples
  - Demonstration of egg inoculation techniques, cell culture, cytopathic effect, plaque assay, serological tests (complement fixation, haemagglutination inhibition, neutralization, ELISA)
5. **Laboratory diagnosis of fungal infections**
  - Collection and transport of specimens
  - Gram stain, KOH preparation, India ink preparation for direct demonstration
  - Sabouraud's dextrose agar/media
  - Lactophenol cotton blue for identification
  - Latex agglutination test
6. **Sterilization and disinfection**
  - Visit to media and sterilization room (demonstration of autoclave and hot air oven)
  - Visit to CSSD
7. **Stool examination for cysts**
  - Collection and transport of stool sample for parasites
  - Direct examination (saline and iodine preparations)
  - Concentration of stool for parasites
  - Identification of cysts

### **Infections of gastrointestinal tract (contd.)**

1. Intestinal nematodes (Classification, epidemiology, life cycles etc.)
2. Intestinal nematodes (Clinical features and lab diagnosis)

- Intestinal cestodes and trematodes (Focus: only those seen in india; incl. cysticercosis)
3. Intestinal cestodes (Epidemiology, clinical features, microbiological aspects, diagnosis)
4. Enterobacteriaceae (Introduction, common features, classification, infections caused - enumeration only)
5. Bacterial diarrhoea and dysentery (Focus: e.coli and shigella)
6. Cholera (Bacteriology, virulence, toxins, pathogenesis)
7. Cholera (Clinical Features, Epidemiology, lab diagnosis, vaccines)
8. Food Borne Pathogens
9. Bacterial food poisoning (Aetiology, toxins, types, etc. include: introduction to staphylococcus and salmonella)
10. Helicobacter pylori (PLUS: 1 I.S. should be taken by clinical department)
11. Viral gastroenteritis (To be accomodated by paediatrics involving microbiologists IN I.S.)
13. Tutorial : Infections of the G.I.T.

### **Infections of liver & lymphatics**

14. Viral hepatitis  
 14a. (Hepatitis A, B)  
 14b. (Hepatitis C, D, E)  
 Echinococcus

### **Infections of the respiratory tract**

17. Streptococcal infections (Group A, B, B: bacteriology, pathogenesis, infections, lab diagnosis), and, introduction to viridans group and pneumococcus
- 16 Filariasis (and brief introduction to other tissue nematodes)
18. Sequelae of streptococcal infection
19. Diphtheria (Bacteriology/ pathogenesis/ lab diagnosis)

20. Diphtheria, whooping cough and acute viral respiratory infections of childhood
21. Agents causing pneumonia (bacterial :incl. gnb, pneumococcus mycoplasma, chlamydia, legionella; viral; pneumocystis)
22. Mycobacteria with special reference to Mycobacterium tuberculosis
23. Infections due to Non-tubercular Mycobacteria (NTM) and Mycobacterium leprae
24. Tuberculosis
25. **Tutorial: infections of respiratory tract**  
Urinary tract infection
26. Urinary tract infections  
**Wound infections/anaerobic infections/fungal infections**
27. Staphylococcal infections - including bacteriology, pathogenesis and lab diagnosis
28. Anaerobic infections of clinical importance GNB anaerobes Clostridia
29. Laboratory diagnosis of wound infections
30. Dermatophytosis
31. Mycetoma & subcutaneous mycosis
32. Systemic mycoses  
Infections of the eyes
33. Eye Infections
34. Tutorial

## **PRACTICAL SCHEDULE FOR IV SEMESTER**

1. **Stool examination for intestinal nematodes and cestodes**
  - Collection/transport and concentration of sample
  - Identification of ova of intestinal nematodes and cestodes
  - Identification of adult worms and larvae
2. **Enterobacteriaceae**
  - Common media and biochemical tests
  - Culture characteristics of members of Enterobacteriaceae
3. **Laboratory diagnosis of E.coli infection and shigellosis**
  - Stool examination for pus cells and RBCs
  - Processing of stool specimen for bacterial culture
  - Cultural characteristics, tests for E.coli and its virulence factors
  - Cultural characteristics of Shigella and its identification (incl. slide agglutination test)
4. **Laboratory diagnosis of cholera**
  - Collection and transport of specimen
  - Culture media and characteristics
  - Identification (incl. motility, oxidase and other tests)
  - Biotyping and serotyping
5. **Laboratory diagnosis of food poisoning**
  - Focus on: laboratory diagnosis of salmonellosis
  - Demonstration for Clostridium perfringens and others
6. **Laboratory diagnosis of filariasis**
  - direct examination/staining for microfilaria
  - demonstration of other aspects of filariasis - including vector
  - include revision of stool examination for helminthic ova
  - include demonstration of hydatid cyst
7. **Laboratory diagnosis of upper respiratory infections**
  - Focus on: laboratory diagnosis of Streptococcus infection
  - Albert's stain
  - Media, identification and toxin of Corynebacterium (demonstration)
8. **Laboratory diagnosis of lower respiratory tract infections**
  - Focus on: Klebsiella and Streptococcus pneumoniae
  - Viral respiratory infection (demonstration of diagnostic methods)

**9. Laboratory diagnosis of tuberculosis**

- Collection of specimens (focus: sputum)
- Concentration methods
- Acid fast staining
- LJ medium and culture characteristics
- Differentiation between Mtb and NTM (basic concept/demonstration)

**10. Laboratory diagnosis of UTI**

- Collection, storage and transport of urine
- Significant bacteriuria and quantitative/semiquantitative methods of culture
- Media: including CLED
- E.coli/ Klebsiella (revision)
- Focus on: Identification of Proteus and Pseudomonas - cultural characteristics like swarming, pigment production; and tests like OF and oxidase

**11. Laboratory diagnosis of wound infections**

- Focus on: Staphylococcus (culture/ identification including tests like catalase and coagulase)

**12. Laboratory diagnosis of anaerobic infections**

- Demonstration of collection of samples for anaerobic culture
- Methods of anaerobiasis - RCMB, anaerobic jar
- Demonstration of media and culture for Clostridium, smears showing sporing and non-sporing GPB, Nagler's reaction etc. and cultures of GN anaerobes like B.melaninogenicus

**13. Laboratory diagnosis of superficial, subcutaneous and deep mycoses**

**V SEMESTER**

**Pyrexia of Unknown origin AND OTHER FEBRILE ILLNESSES**

1. (1A. and 1B.) Enteric fever
2. Malaria
  - 2a. (Transmission, species, life cycle and stages)

- 2b. (Clinical features, lab diagnosis, prevention etc.)
- 3. (3a. and 3b.) Leishmaniasis
- 4. Childhood Viral Exanthema
- 5. Viral haemorrhagic fever
- 6. Rickettsial infection with special reference to Indian rickettsial infection (Indian tick typhus, murine typhus, endemic typhus, scrub typhus)
- 7. Spirochetal infections other than *Treponema pallidum* (Borrelia, Leptospira)
- 8. Septicaemia / Bacteraemia
- 9. Tutorial: P.U.O.

### **Central Nervous system Infections**

- 10. Meningitis
- 11. Encephalitis
- 12. Poliomyelitis
  
- 13. Rabies
- 14. Cysticercosis and other CNS Parasitic diseases
- 15. Slow viruses and prions
- 16. Tutorial : CNS infections

### **Sexually Transmitted Diseases**

- 17. Syphilis
- 18. STD (incl. bacteriology of *Neisseria gonorrhoeae* and other organisms)
- 19. STD (clinical features and lab diagnosis)
- 20. Herpes viruses
  - Herpes viruses – Part 1
  - Herpes viruses – Part 2
- 21. Human Immunodeficiency virus

### **Congenital infections**

- 22. Congenital infections
- 23. Tutorial: Congenital infections and std

### **Miscellaneous**

- 24. Hospital infection, universal precautions and waste management
- 25. Zoonoses (Bacterial, viral, parasitic, fungal)
- 26. Entomology of medical importance



## **PRACTICAL SCHEDULE FOR V SEMESTER**

### **1. Laboratory diagnosis of malaria**

- Preparation, staining and examination of peripheral blood smear for malarial parasite
- Identification of various species and stages
- Thick smear
- Demonstration of vector and newer methods

### **2. Laboratory diagnosis of leishmaniasis**

- Sample collection
- Demonstration of LD bodies
- Demonstration of vector, culture methods and serological tests
- Revision of peripheral blood smear examination

### **3. Laboratory diagnosis of enteric fever**

- Sample collection methods and transport
- Blood culture (in detail)
- Stool and urine culture for Salmonella
- Widal test
- Identification tests and slide agglutination for Salmonella

### **4. Laboratory diagnosis of meningitis**

- Collection, aliquoting and transport of CSF
- Other useful specimens
- Direct smear examination
- Culture media, growth characteristics and identification tests (focus: Neisseria, Haemophilus and Streptococcus pneumoniae)
- Chronic meningitis: pathogens (demonstration e.g. India ink for Cryptococcus)
- Antigen detection

### **5. Laboratory diagnosis of STD**

- Collection and transport of specimens
- Direct demonstration
- Serological tests (focus: syphilis, HIV)

### **6. Entomology**

- Demonstration of medically important entomological specimens

## TEACHING AND LEARNING METHODOLOGY

### Theory

Teaching microbiology to undergraduate medical student is provided with the help of Didactic Lectures, Intradepartmental Seminars (IS), Integrated Seminars and Tutorials that deal with the etiology, pathogenesis, laboratory diagnosis, treatment and control of infections.

### Practicals

8. Microscopy and micrometry
9. Direct demonstration of bacteria by staining
10. Motility tests and biochemical tests for bacterial identification
11. Laboratory diagnosis of viral infections
5. Laboratory diagnosis of fungal infections
12. Sterilization and disinfection
13. Stool examination for cysts, intestinal nematodes and cestodes
14. Laboratory diagnosis of E.coli infection, shigellosis and cholera
15. Laboratory diagnosis of food poisoning
16. Laboratory diagnosis of filariasis
17. Laboratory diagnosis of upper and lower respiratory tract infections
18. Laboratory diagnosis of tuberculosis
19. Laboratory diagnosis of UTI
20. Laboratory diagnosis of wound infections
12. Laboratory diagnosis of anaerobic infections
13. Laboratory diagnosis of superficial, subcutaneous and deep mycoses
14. Laboratory diagnosis of malaria
15. Laboratory diagnosis of leishmaniasis
16. Laboratory diagnosis of enteric fever
17. Laboratory diagnosis of meningitis
18. Laboratory diagnosis of STD
19. Entomology : Demonstration of medically important entomological specimens

# PATHOLOGY

## OBJECTIVES

A MBBS student at the end of training in Pathology will be able to:

1. Understand the concepts of cell injury and changes produced thereby in different tissues and organs and the body's capacity for healing.
2. Understand the normal homeostatic mechanisms, the derangements of these mechanism and the effects on human systems.
3. Understand the etiopathogenesis, the pathological effects and the clinico-pathological correlation of common infectious and non-infectious diseases.
4. Understand the concept of neoplasia with reference to the etiology, gross and microscopic features, diagnosis and prognosis in different tissues and organs of the body.
5. Correlate normal and altered morphology (gross and microscopic) of different organ systems in different diseases to the extent needed for understanding of disease processes and their clinical significance.
6. Have a knowledge of common immunological disorders and their resultant effects on the human body.
7. Have an understanding of the common haematological disorders and the investigations necessary to diagnose them and determine their prognosis.
8. Perform and interpret in a proper manner the basic clinico-pathological procedures.
9. Know the principles of collection, handling and dispatch of clinical samples from patients in a proper manner.

## COURSE CONTENTS

### (A) General Pathology

1. **Introduction to Pathology**
2. **Cell Injury**
  - a) Cell injury: Causes and Mechanism: Ischemic, Toxic.
  - b) Reversible cell injury : Types, morphology: Swelling, vacuolation, hyaline, fatty change.
  - c) Irreversible cell injury : Types of Necrosis

### 3. **Amyloidosis and Calcification**

- a) Calcification : Dystrophic and Metastatic
- b) Amyloidosis : classification, Pathogenesis, Morphology

### 4. **Inflammation and Repair**

- a) Acute inflammation: Features, causes, vascular and cellular events.
- b) Morphologic variants of acute inflammation
- c) Inflammatory cells and Mediators
- d) Chronic inflammation : Causes, types, nonspecific and Granulomatous with examples
- e) Wound healing by primary and secondary union, factors promoting and delaying the process
- f) Healing at specific sites including bone healing

### 5. **Circulatory Disturbances**

- a) Edema : Pathogenesis and types
- b) Chronic venous congestion : Pathogenesis and changes in Lung, Liver, Spleen
- c) Thrombosis and Embolism : Formation, Fate and Effects
- d) Infarction : Types, common sites, Gangrene
- e) Shock : Pathogenesis, Types, Morphologic changes
- f) Derangements of Fluid and electrolyte imbalance

### 6. **Growth Disturbances and Neoplasia**

- a) Atrophy, Hypertrophy, Hyperplasia, Hypoplasia, Metaplasia, Malformation, Agenesis, Dysplasia
- b) Neoplasia : Classification, Histogenesis, Biologic Behaviour : Benign and Malignant; Carcinoma and Sarcoma
- c) Malignant Neoplasia : Grades and Stages, Local and distant spread
- d) Carcinogenesis : Environmental carcinogens, chemical, viral, occupational, Heredity and cellular oncogenes
- e) Tumour and Host Interactions : Systemic effects including paraneoplastic syndromes, Tumor immunology
- f) Laboratory diagnosis : Cytology, Biopsy, Tumor markers

### 7. **Immunopathology**

- a) Immune system : organisation, cells, antibodies and regulation of immune responses.
- b) Hypersensitivity : types and examples, Antibody and cell mediated tissue injury with examples.
- c) Primary immunodeficiency
- d) Secondary Immunodeficiency including HIV Infection
- e) Auto-immune disorders like systemic lupus erythematosus; organ specific and non-organ specific such as polyarteritis nodosa, Hashimoto's disease.
- f) Tumor Immunity

g) Organ transplantation : Immunologic basis of Rejection and Graft versus host reaction

## 8. **Infectious Diseases**

a) Mycobacterial Diseases : Tuberculosis and Leprosy

b) Bacterial diseases : Pyogenic, Typhoid, Diphtheria, Gram negative infection, Bacillary dysentery, Syphilis

c) Viral : Polio, Herpes, Rabies, Measles; Rickettsial, Chlamydial infection

d) Fungal diseases and opportunistic infections

e) Parasitic Diseases : Malaria, Filaria, Amebiasis, Kala-azar, Cysticercosis, Hydatid

f) AIDS: Aetiology, modes of transmission, diagnostic procedures and handling of infected material and health education.

## 9. **Miscellaneous Disorders**

a) Autosomal and sex-linked disorders with examples

b) Metabolic disorders

c) Protein energy malnutrition and vitamin deficiency disorders

d) Radiation Injury

e) Disorders of Pigment and Mineral metabolism such as bilirubin, melanin, hemosiderin

## **(B) Systemic Pathology**

### 1. **Cardiovascular Pathology**

a) Rheumatic fever and Rheumatic Heart Disease : Pathogenesis, Morphology and effects

b) Infective Endocarditis : Causes, Pathogenesis and Morphology

c) Atherosclerosis and Ischemic Heart Disease; Myocardial Infarction

d) Diseases of blood vessels other than atherosclerosis

e) Hypertension and Hypertensive Heart Disease

f) Congenital Heart Disease : ASD, VSD, Fallot's Bicuspid aortic valve, PDA

g) Pericarditis and other pericardial diseases

h) Cardiomyopathy

### 2. **Respiratory Pathology**

a) Structure of Bronchial tree and alveolar walls, normal and altered lung function; concept of obstructive and restrictive lung disorders

b) Inflammatory diseases of bronchi : chronic bronchitis, bronchial asthma, bronchiectasis, chronic obstructive lung disease

c) Pneumonias : Lobar, Broncho, Interstitial

d) Pulmonary suppuration including lung abscess : Etiopathogenesis and Morphology

e) Pulmonary Tuberculosis : Primary and Secondary, Morphologic types including pleuritis

f) Emphysema : Types, pathogenesis

- g) Atelectasis and Hyaline Membrane Disease
- h) Tumors: Benign; Carcinoid, Malignant; Squamous cell, Oat cell, Adeno, etiopathogenesis.
- i) Occupational lung disorders : anthracosis, silicosis, asbestosis, mesothelioma

### 3. **Urinary Tract Pathology**

- a) Renal structure, basis of impaired function, urine analysis
- b) Glomerulonephritis : Classification, Primary Proliferative and Non Proliferative
- c) Secondary Glomerulonephritis : SLE, Purpura, Polyarteritis, Amyloidosis, Diabetes
- d) Nephrotic Syndrome
- e) Acute Renal Failure : Acute tubular and cortical necrosis
- f) Progressive renal failure and end stage renal disease
- g) Pyelonephritis, Reflux Nephropathy, Interstitial Nephritis
- h) Renal tumors : Renal cell carcinoma, Nephroblastoma
- i) Renal vascular disorders, kidney changes in Hypertension
- j) Urinary bladder : cystitis, carcinoma
- k) Urinary Tract Tuberculosis
- l) Urolithiasis and Obstructive Uropathy
- m) Renal Malformations : Polycystic kidneys

### 4. **Pathology of the Gastro-Intestinal Tract**

- a) Oral Pathology : Leukoplakia; Carcinoma oral Cavity and Esophagus
- b) Salivary gland tumors : Mixed, Adenoid cystic, warthin's
- c) Peptic ulcer : etiopathogenesis and complications; gastritis: types
- d) Tumors of stomach : Benign; Polyp, Leiomyoma, Malignant; Adenocarcinoma, Lymphoma
- e) Inflammatory diseases of small intestine : Typhoid, Tuberculosis, Crohn's, Appendicitis
- f) Inflammatory diseases of appendix and large intestine : Amoebic colitis, Bacillary dysentery, Ulcerative Colitis
- g) Ischemic and Pseudomembranous enterocolitis, diverticulosis
- h) Malabsorption : Celiac disease, Tropical sprue and other causes
- i) Tumours and Tumor like condition of the large and small intestine : Polyps, Carcinoid, Carcinoma, Lymphoma
- j) Pancreatitis
- k) Pancreatic tumors : Endocrine, Exocrine and periampullary

### 5. **Hematopathology**

- a) Constituents of blood and bone marrow, Regulation of hematopoiesis
- b) Anaemia : classification and clinical features; clinical and lab. approach to diagnosis

- c) Nutritional anaemias : Iron deficiency anaemia, Folic Acid/Vit B 12 deficiency anaemia including pernicious anaemia
  - d) Hemolytic Anaemias : Classification and investigation
  - e) Hereditary hemolytic anaemias : Thalassemia, sickle cell anaemia
  - f) Hereditary hemolytic anaemias : hereditary spherocytosis, G-6-PD deficiency
  - g) Acquired hemolytic anaemias
  - h) Hemolytic Anaemias : Autoimmune, Alloimmune, Drug induced Microangiopathic and Malaria
  - i) Aplastic Anaemia, PNH and Myelodysplastic syndrome
  - j) Hemostatic disorders : Platelet deficiency; ITP, Drug induced, secondary
  - k) Coagulopathies : Coagulation factor deficiency; hemophilia, DIC and anticoagulant control
  - l) Leukocytic disorders : Leukocytosis, leukopenia, leukemoid reaction
  - m) Acute and chronic Leukemia : Classification, Diagnosis
  - n) Myeloproliferative disorders : Polycythemia, Myelofibrosis
  - o) Multiple myeloma and dysproteinemias
  - p) Blood transfusion : grouping and cross matching, untoward reactions, transmissible infections including HIV and hepatitis
6. **Liver and Biliary Tract Pathology**
- a) Jaundice : Types, Pathogenesis and Differentiation
  - b) Hepatitis : Acute and Chronic, Etiology, Pathogenesis and Pathology
  - c) Cirrhosis: Etiology, Postnecrotic, Alcoholic, Metabolic, Pathology, Morphology (Macronodular, Micronodular, Mixed), complications
  - d) Portal Hypertension : Types including non-cirrhotic portal fibrosis and Manifestations
  - e) Tumors of Liver : hepatocellular and metastatic carcinoma, tumor markers
  - f) Concept of hepatocellular failure
  - g) Diseases of the gall bladder : Cholecystitis, Cholelithiasis, Carcinoma
7. **Lymphoreticular System**
- a) Lymphadenitis : nonspecific, Granulomatous
  - b) Hodgkin's and Non-Hodgkin's Lymphomas : Classification, Morphology
  - c) Diseases of the spleen : Splenomegaly causes and effects
  - d) Thymus : Dysgenesis, Atrophy, Hyperplasia, Neoplasia
8. **Reproductive System**
- a) Diseases of cervix : cervicitis, cervical carcinoma, etiology, types and cytologic diagnosis
  - b) Hormonal influences and histological appearances of different phases of menstrual cycle and the abnormalities associated with it
  - c) Diseases of uterus : endometritis, endometrial hyperplasia and carcinoma, adenomyosis,

smooth muscle tumors

- d) Trophoblastic disease : Hydatidiform mole, Choriocarcinoma
- e) Diseases of the breast : Mastitis, abscess, Fibrocystic disease, Neoplastic lesions : Fibroadenoma, Carcinoma, Phyllodes tumor
- f) Prostate : Nodular Hyperplasia and Carcinoma
- g) Ovarian and testicular tumors
- h) Carcinoma of penis
- i) Pelvic inflammatory diseases including salpingitis
- j) Genital Tuberculosis

#### 9. **Osteopathology**

- a) Bone – general considerations, reactions to injury and healing of fractures
- b) Osteomyelitis : Acute, Chronic, Tuberculous, Mycetoma
- c) Metabolic diseases : Rickets/Osteomalacia, Osteoporosis, Hyperparathyroidism
- d) Tumors : Primary, Osteosarcoma, Osteoclastoma, Ewing's Sarcoma, Chondrosarcoma; Metastatic
- e) Arthritis : Rheumatoid, Osteo and tuberculous

#### 10. **Endocrine Pathology**

- a) Scope of endocrine control and investigations
- b) Diabetes Mellitus : Types, Pathogenesis, pathology
- c) Nonneoplastic lesions of thyroid : Iodine deficiency goiter, autoimmune thyroiditis, thyrotoxicosis, myxedema
- d) Tumors of thyroid – adenoma, carcinoma : Papillary, Follicular, Medullary, Anaplastic
- e) Adrenal diseases : Cortical hyperplasia, atrophy, tuberculosis, tumors of cortex and medulla
- f) Parathyroid hyperplasia and tumors and Hyperparathyroidism
- g) Pituitary tumors
- h) Multiple endocrine neoplasia

#### 11. **Neuropathology**

- a) Structural Organization, specific cell types, and reaction patterns
- b) Inflammatory disorders : Pyogenic and tuberculous meningitis, brain abscess, tuberculoma
- c) CNS tumors – primary : glioma and meningioma (excluding histopathology) and metastatic
- d) CSF and its disturbances : cerebral edema, raised intracranial pressure
- e) Cerebrovascular diseases : Atherosclerosis, thrombosis, embolism, aneurysm, Hypoxia, Infarction and Hemorrhage
- f) Peripheral neuropathies and demyelinating disorders
- g) Diseases of muscles
- h) Traumatic lesions of CNS



**(C) Practicals**

- a) Identify and interpret the gross and/or microscopic features of common disorders as given above.
- b) Perform with accuracy and reliability basic haematological procedures such as haemoglobin estimation, total and differential WBC count and peripheral blood smear staining, examination and report.
- c) Calculate the indices and interpret the relevant significance.
- d) Perform the basic laboratory haematological tests like bleeding time and clotting time
- e) Perform a complete examination of the urine and detect any abnormalities
- f) Grouping and cross matching of blood
- g) Collect and dispatch clinical samples from patients in a proper manner
- h) Interpret abnormal biochemical laboratory values of common diseases.

# PHARMACOLOGY

## OBJECTIVES

MBBS student, at the end of one and a half years training in Pharmacology, is expected to:

1. Understand pharmacokinetic and pharmacodynamic principles involved in the use of drugs
2. Understand and identify the various factors that can affect the action of drugs
3. Know the various routes of drug administration with advantages and disadvantages of the various routes
4. Undertake dosage calculations as appropriate for the patient and be able to select the proper drug and dose for the at risk population i.e. patients with kidney or liver disease, elderly, pregnant and lactating females, and children.
5. Understand the importance of rational prescribing of drugs and the concept of essential drugs
6. To be able to identify and monitor adverse drug reactions (ADRs) and appreciate the importance of ADR reporting
7. Know the drugs used in systemic illnesses, infections and chemotherapy etc. with main mechanism(s) of action, pharmacokinetics, uses, side-effects and indications
8. Understand the principles and practice of pharmacy
9. Understand the methods in experimental pharmacology, principles of bioassay and be able to correlate drug effects with the action of drugs at the receptors.
10. Have knowledge of common drugs and doses used for different ailments
11. Have an understanding of basic mechanism by which a drug acts
12. Should be able to select rationally from the available drugs

## COURSE CONTENT

### Theory

#### (A) General Pharmacology

- a) Absorption, distribution, metabolism and elimination of drugs, routes of drug administration
- b) Basic principles of drug action
- c) Adverse reactions to drugs
- d) Factors modifying drug response

#### (B) Autonomic nervous system & Peripheral nervous system

- a) Neurohumoral transmission

- b) Sympathetic nervous system - sympathomimetics, sympatholytics
- c) Parasympathetic - Cholinergics, Anticholinergics, Ganglion stimulants and blockers
- d) Skeletal muscle relaxants
- e) Local anaesthetics

### **(C) Central nervous system**

- a) General principles - neurotransmitters, definition and common transmitters
- b) Drug therapy of various CNS disorders like epilepsy, depression, Parkinson's disease, schizophrenia, neuro- degeneration etc.
- c) Pharmacotherapy of pain
- d) General anaesthetics
- e) Drugs for arthritides & gout

### **(D) Autacoids**

- a) Histamine and antihistaminics
- b) Prostaglandins, leukotrienes, thromboxane and PAF
- c) Substance P, bradykinin

### **(E) Cardiovascular system**

- a) Drug therapy of hypertension, shock, angina, cardiac arrhythmias
- b) Renin angiotensin system
- c) Diuretics
- d) Coagulants and anticoagulants, antiplatelet drugs
- e) Hypo-lipidemics

### **(F) Gastrointestinal and respiratory system**

- a) Emetics and antiemetics
- b) Drugs for constipation and diarrhoea
- c) Drug treatment of peptic ulcer
- d) Drug therapy of bronchial asthma
- e) Pharmacotherapy of cough

### **(G) Hormones**

- a) Reproductive hormones - testosterone, estrogen, progesterone, contraceptives
- b) Drug therapy of Diabetes
- c) Thyroid hormones
- d) Pituitary-hypothalamic axis
- e) Corticosteroids
- f) Oxytocin and drugs acting on uterus
- g) Drugs affecting calcium balance

**(H) Chemotherapy**

- a) General principles of antimicrobial chemotherapy, rational use of antibiotics
- b) Chemotherapeutic agents - Penicillins, cephalosporins, fluoroquinolones, macrolides, aminoglycoside, tetracyclines, chloramphenicol and polypeptide antibiotics etc.
- c) Chemotherapy of tuberculosis, leprosy, UTI
- d) Chemotherapy of parasitic infection
- e) Chemotherapy of fungal infections
- f) Cancer Chemotherapy

**(I) Miscellaneous**

- a) Immunomodulators
- b) Drug therapy of glaucoma and cataract
- c) Treatment of poisoning

**PRACTICALS****A) Experimental pharmacology exercise on isolated organ**

- Assay of various drugs using guinea pig ileum
- Identification of unknown drugs by evaluating its action antagonism and drug interaction on guinea pig ileum
- Determination of concentration of unknown drug solution by different methods

**B) Experimental exercise on pharmacy**

- General principles of pharmacy
- Prescription writing exercises
- Preparation and dispensing of powders, emulsions ointments, mixtures, liniments, suppositories and syrups

**C) Spotting exercise - Identify the commonly used items in Pharmacology****D) Exercises on drug interactions****TEACHING AND LEARNING METHODOLOGY**

The pharmacology teaching shall be done with the goal of making the student understand the concept of rational use of drug.

**General pharmacology and systemic pharmacology**

It shall be taught by way of lectures. Each lecture session will be planned to deliver maximum relevant information to the student. The clinical aspects as well as rationality of use of a given drug shall be discussed with the students. In addition, seminars on some important topics will be planned in which the use of a given drug shall be discussed by a clinical expert in the field.

**Practicals**

The given practical exercise shall be discussed and demonstrated beforehand to the students. In addition, the students will learn prescription writing and discuss exercise on drug interactions and shall also be shown various spots. The spots shall include various chemicals, drugs and instruments used in pharmacology.

# ANAESTHESIOLOGY

The purpose of anesthesia training for medical students is not to make anesthesiologists out of all medical students, but to give students knowledge of basic concepts used in anesthesia and to teach them skills of airway management and vascular access that may be useful to them in other areas of medical practice.

The physician should have a good knowledge of what the anesthetic will do to the patient, even though the physician does not administer it him or herself.

The student, therefore, should observe and study the physiological changes which take place in the anesthetized patient. When these changes are of sufficient magnitude, they become complications or toxic effects. The student should learn what these are, how they are caused, and how they may present and be treated. Emphasis should be laid on good preoperative preparation. Students should learn basic techniques of maintaining a clear airway and giving assisted or artificial ventilation. They should also learn how to position the patient's head, how to hold the chin and how to insert an airway. Medical students should learn enough about an anesthetic machine.

In addition to these technical accomplishments, the student may have the opportunity to administer either general or spinal anesthesia under the direct and constant supervision of a member of the staff.

## OBJECTIVES

### Knowledge

The students, at the end of their posting should be able to:

1. Introduce principles of acute medicine as it is practiced in managing the anesthetized patient in the operating room and in managing the patient in the recovery unit.
2. Discuss and demonstrate principles of applied physiology and applied pharmacology. Simulation on Human patient Simulator (HPS) is ideal to teach many aspects of applied physiology and pharmacology.
3. Review principles of and teach skills in resuscitation (cardiopulmonary, cerebral, fluid and others).
4. Teach care of the unconscious patient, including airway and ventilation management.
5. Teach management of blood, fluid, electrolyte balance, and metabolic disturbances in the surgical patient, with specific emphasis on those derangements which are encountered in the anesthetized patient.
6. Review management of acute and chronic pain problems.
7. Introduce concepts of drug interactions, especially as they apply to patients receiving anesthesia.
8. Demonstrate the evaluation of patients relative to surgical and anesthetic risk. Teach appropriate

preoperative preparation of patients subjected to surgery and anesthesia.

9. Introduce the various techniques of anesthesiology.
10. Pharmacology of muscle relaxant, application and monitoring
11. Pharmacology : Basic / Applied of local anaesthetics : Various types of blocks advantages / Problems with each. Descriptive for some main blocks. Local infiltration , Brachial Plexus, Caudal etc.

### **Skills**

Maintenance of Clear airway

Bag Mask Ventilation

Starting A Venous Access

CPR — Basic and advanced

Giving a simple infiltration block, Some nerve block

Performing A lumbar puncture

### **TEACHING LEARNING METHODOLOGY**

Teaching and learning in anesthesiology should be guided through a series of posting in which the emphasis is laid on practical hands –on experience.

Human patient simulator (HPS) be purchased for better skill development and to reduce the danger to the patients during the learning curve of student. To allow repeat practice according to ability of the student to reach the level of competence needed.

#### **Posting Schedule**

To achieve the objectives The students will be posted to

#### **Preanesthetic Clinic :**

**1 Preoperative evaluation & optimization.**

**2 Operating theatre:** Anaesthetic Machine /monitoring, Anaesthetic Techniques

**3 Recovery Room:** Recovery criteria : Management of complications.

**4 Intensive Care Unit :** Management of respiratory failure Various types of ventilatory Assistance devices Monitoring Devices and application. Management of patient in Coma.

**5 Pain Clinic :** Evaluation of patient / non invasive / invasive management.

#### **Emergency On Call**

The Intern will be posted to same areas as above and Will be asked to follow a case from preoperative preparation to full recovery to get an idea of comprehensive Care.

A log book will need to be completed by the student under the supervision of the faculty member

## COMMUNITY MEDICINE

The broad goal of teaching in Community Medicine is to prepare the student to function effectively as a community physician.

### OBJECTIVES

At the end of the course, the student should be able to:

1. Describe the concepts of community health and measures of levels of health.
2. Describe the epidemiological methods.
3. Apply appropriate epidemiological methods to communicable and non-communicable diseases in the hospital and community situations.
4. Use epidemiological tools to make rational decisions relevant at the individual and community levels.
5. Describe and use basic bio-statistical methods.
6. Select, use and interpret bio-statistical methods to make inferences from hospital/community data.
7. Describe the demographic pattern of the country and its relation to health.
8. Define vital statistics and describe the various methods that are used to collect vital statistics in India.
9. Describe environmental hazards - inside the home, at the workplace and in the community.
10. Describe and analyze the importance of water and sanitation in human health.
11. Suggest feasible methods of environmental control at household and community levels.
12. Describe common occupational hazards in industries, agriculture, and services available to industrial workers.
13. Describe feasible methods of control of occupational hazards.
14. Plan, collect, analyze, interpret and present data from a hospital/community survey.
15. Describe and analyze the roles of the individuals, family, community and socio-cultural milieu in health and disease.
16. Diagnose and manage maternal and child health problems and advise couples and the community on the family planning methods available.
17. Diagnose and manage common nutritional problems at the individual and community levels.
18. Describe the methods of nutritional assessment in the community.
19. Describe the important/common health problems in India.
20. Describe the School Health Programme
21. Describe the health information system in India with reference to the Management Information System.

22. Describe and evaluate the National Health Programmes.
23. Describe the health care delivery system in India.
24. Describe the organization and functions of the health care team at Primary Health Centre, Community Health Centre and District levels.
25. Interact with other members of the health care team and participate in the organization of health care services and implementation of National health Programmes.
26. Plan and implement measures for disaster management.
27. Describe the principles and components of primary Health Care, National Health Policy and its implementation in the country.
28. List the goals/ targets set to achieve Health for All by 2010 A.D.
29. Diagnose and manage common health problems and emergencies at the individual, family and community levels keeping in mind the existing health care resources, prevailing socio-cultural beliefs and family resources.
30. Plan and implement an intervention programme with community participation.
31. Plan and implement, using simple audiovisual aids, a health educational programme and carry out its evaluation.

## **COURSES**

### **1. BEHAVIORAL SCIENCES**

#### **Objectives**

**At the end of the course the student should be able to:**

1. Define social & behavioural sciences and discuss their role in Community Medicine.
2. Describe the role of the family/community in health and disease.
3. Measure the socio-economic status of a family and describe its importance in health and disease.
4. Construct, pre-test and validate questionnaire/interview schedule.
5. Define attitudes.
6. Describe the process of attitudinal development and methods to change.
7. Construct, pretest and validate a questionnaire / interview schedule to test attitudes of a community.

#### **Contents**

- Culture, Society and Health
- Role of Family in health and disease
- Health, illness behaviour
- Social Organization and Community Participation
- Measurement of Socioeconomic Status and its importance in relation to health and disease.
- Questionnaire/Interview schedule designing
- Practical: Construction and pre-testing of questionnaire/ interview schedule
- Attitudes: nature, development, methods to change



- Measurement of attitudes
- Questionnaire design to test attitudes.

## 2. HEALTH EDUCATION

### Objectives

**At the end of the course the student should be able to:**

1. Describe health education and its methods.
2. Communicate effectively with the individual, family and community.
3. Plan and conduct health Education sessions for an individual/community.
4. Design different health education aids e.g. posters, scripts for role-play, film etc.
5. Use different health education aids, video etc. to educate the community.
6. Evaluate the health education programme.

### Contents

- Definition and principles of health education
- Health educational methods
- Audiovisual aids
- The art of communication
- Skills of communication
- Methods of overcoming resistance in the individual, family and community.
- Planning a health educational programme
- Use of other aids in health education
- Evaluation of health educational activities
- Information Education Communication Strategies
- Practical exercise: preparing and delivering a health educational talk on simple issues:
  - Personal hygiene
  - Clean water

Clean domestic environment Community Medicine

- Clean external environment
- Dental hygiene
- Any other topic

## 3. ENVIRONMENT

### Objectives

**At the end of the course the student should be able to:**

1. Describe the physical environment inside the home, at the workplace and in the community, and its impact on health and disease.
2. Describe the family environment.

3. Suggest appropriate methods for improving the internal/external environment.
4. Define safe water. Describe the sources of water (tap, hand pump, well).
5. State the criteria (national and WHO) for safe water.
6. Describe appropriate methods for making water safe at the domiciliary level.
7. Describe sources of waste and methods of waste control at individual and community levels.
8. Define air pollution, causes of air pollution and describe appropriate measures of control.
9. Describe the effects of noise and radiation on health.
10. Describe the common vectors of diseases and methods of vector control.
11. Describe the various insecticides that are used for vector control.
12. Describe insecticide resistance.

### **Contents**

- Environment:
  - housing
  - physical environment inside and outside the home
  - family environment
- Water
- Waste
- Air pollution, green house effect, ozone layer
- Noise and radiation pollution
- Vectors of disease
- Vector Control and insecticidal resistance.

## **4. BIOSTATISTICS**

### **Objectives**

**At the end of the course the student should be able to:**

1. Define, calculate and interpret commonly used statistical methods.
2. Select and use appropriate diagrammatic representations of statistical data.
3. Define probability.
4. Define normal distribution.
5. Define bias, random error.
6. Describe methods of sampling and calculate sample size.
7. Carry out random and cluster sampling.
8. Describe the demographic pattern of the country.
9. Define vital statistics, describe their method of collection.
10. Describe the sources of data and their merits for use and census in India.

### **Contents**

- Need of Bio-statistics in Medicine

- Statistical Methods
- Frequency Distribution
- Measures of Central Tendency.
- Proportions
- Tabular & diagrammatic presentation of data probability
- Normal Distribution
- Standard error estimation
- Tests of Significance
- Alpha, Beta error
- Confidence Interval
- Bias/Random errors
- Sample size calculation
- Sampling methods
- Practical exercise in - random sampling - cluster sampling (EPI) Vital Statistics, census
- Demography

## **5. EPIDEMIOLOGY**

### **Objectives**

**At the end of the course, student should be able to:**

1. Define measures of morbidity/mortality.
2. List and describe the sources of epidemiological data.
3. Describe, with suitable examples, Bradford Hills' criteria of causation.
4. Describe and illustrate natural history of a disease with suitable examples (communicable and non-communicable).
5. Collect relevant clinical, psychosocial information from a patient and family, analyze and present to illustrate the natural history of a common disorder.
6. Advise relevant (psychosocial, cultural and economic context) promotive, preventive, curative and rehabilitative measures for the disorder.
7. Describe the need and uses of screening tests.
8. Differentiate between screening and diagnostic tests.
9. Calculate the sensitivity, specificity, positive predictive value of tests given a set of data.
10. Describe the various types of epidemiological study designs, their application, biases, statistical analyses, relative merits and demerits.

### **Contents**

- Definitions, scope in hospital, community, planning
- Measures of Morbidity/Mortality
- Rates: Incidence, Prevalence

- Death rate
- Crude rates/standardized rates
- Fertility Rates Years
- Person Years
- Ratio
- Proportions
- Risk
- Sources of epidemiological data
- Causation
- Natural history of disease for communicable and non-communicable diseases.
- Levels of disease prevention
- Clinico-psycho-social case review
- Principles of control of communicable disease
- Principles of control of non-communicable disease
- Measurement
- Screening Tests
- Diagnostic Tests
- Cross sectional and case studies
- Longitudinal study
- Case control study
- Randomized Control Trials

## **6. NUTRITION**

### **Objectives**

**At the end of the course the student should be able to:**

1. Describe the nutrients (carbohydrates, proteins, fats, vitamins and minerals) and their dietary sources.
2. Describe the daily nutritional requirements for different ages, sexes, pregnant and lactating women.
3. Describe the deficiency disorders (both macro and micro nutrimental status).
4. Describe the features of Protein Energy Malnutrition.
5. Describe the various methods of measuring the nutritional status.
6. Assess the nutritional status of the community.
7. Define balanced diet.
8. Prescribe a balanced diet within the socio-cultural, and economic milieu for
  - a normal adult male/female
  - a pregnant/lactating/postpartum woman
  - an under five child
  - an adolescent
9. Describe the management of PEM affected child in community.
10. Describe and prioritise the nutritional problems in India.

11. Describe the importance of salt fortification.
12. Describe the nutritional programmes in India.
13. Define food adulteration and describe the methods for detecting and controlling food adulteration.

### **Contents**

- Role of nutrition in health and disease
- Nutritional requirements and sources
- Balanced Diet
- Deficiency Disorders and Micronutrient Deficiencies
- Salt fortification
- Protein Energy Malnutrition
- Nutritional problems in India
- Nutritional programmes
- Assessment of nutritional status in community; Growth Charts.
- Practical exercise:- nutritional status assessment in community. Presentation
- Food adulteration

## **7. MATERNAL & CHILD HEALTH**

### **Objectives**

**At the end of the course the student should be able to:**

1. State the magnitude of the problems of maternal and child health in India.
2. Advise a mother on the importance of breast feeding and weaning at appropriate time and addition of weaning foods.
3. Identify and manage high risk mothers and children.
4. Define an eligible couple. Calculate eligible couple protection rate.
5. Describe the various family planning methods. Describe the indications, contraindications, side effects and complications of the methods.
6. Advise a couple on spacing and terminal methods.
7. Describe salient features of National Population Policy 2001-02.

### **Contents**

- Magnitude of the problem
- Maternal morbidity and mortality, under five morbidity mortality.
- Breast feeding/Weaning
- High risk mothers and children
- Family Planning Methods: Spacing and Terminal Methods and emergency contraception
- Practical exercise: observe:
  - insertion of IUD
  - MTP
  - tubal ligation

- vasectomy

## **8. REHABILITATION**

### **Objectives**

At the end of the course the student should be able to:

1. Define and describe the different types of rehabilitation.
2. Define and describe the different types of impairment, disability and handicap.
4. Make a community assessment of post polio residual paralysis.
4. Advise rehabilitation at individual and community levels.

### **Contents**

- Need for Rehabilitation. Types of rehabilitation. Types of impairment, disability, handicap
- Assessment of Postpolio Residual Paralysis
- Rehabilitation at individual level
- Community based rehabilitation
  - Practical exercise: Post Polio residual paralysis assessment. Presentation.

## **9. EPIDEMIOLOGY OF COMMUNICABLE DISEASES AND NON-COMMUNICABLE DISEASES**

### **Objectives**

**At the end of the course the student should be able to:**

1. Describe the epidemiology of common communicable diseases.
2. Describe the epidemiology of common non-communicable diseases.
3. Describe the steps involved in investigating an epidemic.
4. Plan and investigate an epidemic of a communicable disease in a hospital/ community setting, and institute control measures.
5. Describe the immunization schedule and side effects of the immunizing agents.
6. Immunize a child.
7. Describe the cold chain and the importance of maintaining the cold chain.

### **Contents**

- Malaria
- STDs / HIV/AIDS
- Pulmonary Tuberculosis
- Leprosy
- Diphtheria, Pertussis, Tetanus
- Poliomyelitis
- Measles, Mumps & Rubella
- Chicken Pox, A.R.I.

- Diarrhoeal Diseases
- Infective Hepatitis
- Kala azar
- Arbo viral diseases
- Filaria
- Plague
- Intestinal infestations
- Investigation of an Epidemic
- Immunity
- MCH
- Immunization for international travel
- Surveillance for diseases
- Nutritional Disorders
- RHD /CHD / Hypertension
- Cancers
- Blindness
- Road Traffic Accidents
- Diabetes mellitus
- Obesity

## **10. IMPORTANT NATIONAL HEALTH PROGRAMMES**

### **Objectives**

**At the end of the course the student should be able to:**

1. Describe the national health programmes for the control of communicable diseases.
  - RCH
  - Immunization
  - Family Welfare
  - Iodine Deficiency Disorders
  - ARI
  - Tuberculosis
  - Diarrhoeal diseases
  - Malaria
2. Describe the national health programmes for control non-communicable diseases.
3. Describe the role of the health services in these programmes.
4. Evaluate an important health programme.

### **Contents**

- Health Programmes on:

- RCH (including ARI, Diarrhoeal Diseases)
- Immunization
- Family Welfare
- Iodine Deficiency
- Nutrition, ICDS
- Tuberculosis
- Malaria, Filaria, Kala Azar
- Evaluation of a health programme
- HIV/ AIDS & STDs
- Leprosy
- RHD/ CHD/ Hypertension
- Diabetes
- Blindness
- Cancer

## **11. OCCUPATIONAL HEALTH**

### **Objectives**

**At the end of the course the student should be able to:**

1. Describe the common industrial and occupational diseases.
2. Describe the feasible methods of control of occupational diseases.
3. Describe the important features of the Workman Compensation Act and provision of health services and health insurance to industrial workers.

### **Contents**

- Working environment, health hazards of industrial and agricultural workers
- Common occupational lung diseases
- Common occupational skin diseases and cancers
- Industrial Toxic Substances
- Principles of prevention of Occupational diseases
- Legal status in relation to Workman Compensation Act
- Employees' State Insurance Act
- Practical exercise - visit to a factory

## **12. HEALTH ADMINISTRATION**

### **Objectives**

At the end of the course, the student should be able to

1. Describe the organization of health services at all levels and the School Health Programme.
2. Describe the concepts, components, principles of primary health care.
3. Describe natural and man made disasters and disaster management.



4. Functions of various categories of workers at PHC.

### **Contents**

- Planning and organizational set up of health services in India
- Primary Health Care
- Health Team at District Hospital, Community Health Primary Health Centre
- School Health
- Management of health resources
- Voluntary and international agencies in health care
- Natural and manmade disasters and disaster management

## **13. HEALTH ECONOMICS**

### **Objective**

At the end of the course, the student should be able to:

1. Appreciate cost considerations in clinical and public health interventions.

### **Contents**

- Need of health economics
- Methods of economic analyses in health

## **14. GERIATRICS**

### **Contents**

- Problems of the elderly
- Social organizations to assist the elderly

## **15. COUNSELLING**

### **Objective**

- At the end of the course the student should be able to:
- Understand the need for counselling in various situations ego HIV infection, AIDS, sexuality, Family Planning etc.

### **Contents**

- The students will observe counselling being done in the various situations.

## **FIELD POSTINGS IN COMMUNITY MEDICINE**

### **1. Urban Health Centre**

## Objectives

**At the end of the posting, the student should be able to:**

1. Manage common ailments at primary level in the urban community.
2. Understand the medico-social problems of patients attending the mobile clinic.
3. Understand the art of counselling in sex and marriage problems.
4. Understand the pattern and utilization of patient referrals.
5. Describe the existing health care services available to the urban community.
6. Study a health related problem in the community.

## Learning Experiences

1. Attending Shekhar Hospital (P)Ltd., Indira Nagar to learn services available at secondary level.
2. Attending the Sex and Marriage Counselling clinic at HIMS to learn the art of sex and marriage counselling.
3. Attending the Mobile clinic at slum areas to learn about the patterns of morbidity, care of patients and referrals at primary level.
4. Clinico-psycho-social review: Each student will be allotted a case in the community to take history and do a complete physical examination and reach a diagnosis. This will be followed by a visit to the patient's family to determine the psycho - social aspects of the disease and the effects on the patient and family. The student will also have to advise appropriate intervention, Individual presentation.
5. Participating in the immunization, health education activities and special exercises like survey.
6. Participating in the delivery of health care to the urban community.

## 2. Family Health Advisory Service

### Objectives

1. To understand the dynamics of Health & Disease in a family.
2. To study the family structure and health status of the individual members with special reference to:
  - (a) Nutritional status
  - (b) Immunization status
  - (c) General Health status
  - (d) Environmental status
  - (e) Socio-Economic status
  - (f) Family Welfare Planning status
3. To identify the Health problems of families over a period (of posting).
4. To assess the knowledge, attitude, behaviour and practices regarding health and disease.
5. To identify the communication and decision making process in the family, and utilization of health services by the families.
6. To counsel the family in solving their health problems and to educate the families to improve their health and family welfare.
7. To provide services to the families allotted (with the help of FHAS Team).

## Methodology

The whole class is divided into two (2) batches and each batch will have two **faculty supervisors** during field visits as well as in briefing. The junior residents will act as **preceptors**. Each batch visits the allotted families along with preceptors once a week and discuss the findings with faculty supervisor next week.

The students will also maintain a record of their family visits and present the family's case history book at the end of the posting.

## 3. Rural Health Training Centre

### Objectives

At the end of the posting, the student should be able to:

1. Manage patients at the primary and secondary level in a rural setting.
2. Describe the factors which contribute to or affect health practices.
3. Conduct an epidemiological study, plan and execute an intervention programme in a rural community.
4. Describe the model of health care delivery in rural areas and the National Health Programmes.
5. Describe the hazards of asbestos, the prevention and management of asbestosis.

### Learning Experiences

#### 1. Management of patients:

During the posting student must find the opportunity to see the entire spectrum. If, because of seasonal variation it is not possible to see patients suffering from certain diseases, student should make it a point to examine such patients in the HIMS hospital.

While examining patients the following is to be

learnt: History taking

Complete physical findings

Relevant differential diagnosis

Relevant investigations

Management to include

- treatment
- follow up
- referral when necessary

Simple procedures

- intramuscular injections - passing Ryles tube
- dressings
- incision & drainage
- splinting of fractures
- perineal wash down

The students will be posted by rotation in the specialties of Medicine, Paediatrics, Gynaecology / Obstetrics, and Surgery.

Case work-up of all patients admitted under the specialties.

Teaching by faculty members from the above specialties from Wednesday to Saturday. They will discuss patients from the Ward, OPD and special clinics.

Evening rounds with Senior Residents of concerned specialty.

Demonstration of the procedures mentioned above, and if possible, the student will carry out these procedures under the supervision of the faculty member and the Senior Resident.

## **2. Factors which contribute to or affect health practices.**

Health practices in 4 conditions will be covered. These are pulmonary tuberculosis, antenatal case, antenatal high risk case, and protein energy malnutrition in a child.

Patients will be allotted to the students for complete work up.

Family visits will be made. The families will be interviewed to ascertain the necessary information. Discussion following each visit.

Information to be collected for each condition:

### ***Pulmonary Tuberculosis:***

Index case - occupation, literacy & social status

Social & environmental factors and their contribution to the disease

Steps taken by the patient for his own treatment

Preventive measures for other family members

Condition of the patient at the time of visit

Health education

### ***Antenatal Case:***

Literacy of the family and the woman

Customs - social or religious during pregnancy, delivery and

lactation Dietary habits - particularly restrictions during pregnancy

Knowledge, attitude & practices regarding antenatal care

High risk pregnancy - identification Health

education / Family Planning advice

### ***Protein Energy Malnutrition:***

Socio-economic status of the family

Infant feeding & weaning practices Social

customs regarding diet for children

Environmental factors contributing to malnutrition

Knowledge, attitude & practices about nutrition & steps taken for the management of child

## **3. Statistical data of Satrikh and comparison with the national figures.**

The statistics to be known are:

Birth Rate

Death Rate

Infant Mortality Rate Maternal

Mortality Rate Eligible

Couple Protection Rate

Immunization Coverage

#### **4. Conduction of an epidemiological study.**

Selection of a problem occurring in the community.

Review literature to find out the extent of the problem in the country.

Decision whether to survey the entire population or a sample using the usual sampling techniques.

Designing a proforma, pretesting and then using.

Data collected is analyzed and presented to the faculty of community medicine for discussion.

A plan for feasible intervention measures is drawn up and will be executed.

The final report (typed two copies) is to be submitted within 1 week of completion of the posting.

#### **5. Models of health care delivery in rural areas and the national health programmes:**

A visit to the Chief Medical Officer's office (Barabanki) to learn the following: organization of services

administrative structure functions of

- PHCs
- Rural dispensaries
- Referral hospitals
- District hospitals

collection of data at district headquarters transmission of data from district headquarters drug supply national health programmes at district level

- Malaria
- Tuberculosis
- Family Welfare
- EPI/UIP

constraints in functioning

Visits to 3 Primary Health Centres (Satrikh, Harakh and Jata Baroli) to compare and contrast the functioning of all. The main objectives of these visits are to make you realise the vast gap between theory and practice of primary health care. The following will be learnt:

the functions of the PHC

roles of the following field workers

- Male Multipurpose Worker
- Female Multipurpose Worker - Male supervisor
- Female supervisor
- Dai
- Community Health Volunteer

**6. Industrial health.**

Visit to an industrial unit Brindavan Coca cola bottling plant, to learn the following:

Nature of work done

Occupational hazards

Clinical profile & laboratory investigations done

Statistics regarding people developing diseases

Action taken for diseased people

Preventive measures taken by the factory

Expenditure on medical & preventive measures

## DERMATOLOGY AND VENEREOLOGY

Skin diseases are quite prevalent in the community and a large number of patients attending to any hospital OPD come with the complaints related to skin diseases. Most skin diseases can be easily diagnosed and managed with adequate amount of training at the MBBS level. HIMS has designed a comprehensive training syllabus for undergraduates in Dermatology, which includes the Dermatology, Venereology & Leprosy. The aim of the training is to train the candidates to diagnose and manage common skin diseases.

### OBJECTIVES

#### Knowledge

At the end of the training a candidate should be able to-

1. Diagnose and manage common skin diseases, sexually transmitted diseases and leprosy.
2. To diagnose and manage common medical emergencies related to skin diseases, leprosy and sexually transmitted diseases.
3. To familiarize them with the common laboratory diagnostic skills which help in the confirmation of diagnosis.
4. To train them for preventive measures at individual and community levels against communicable skin diseases including sexually transmitted diseases and leprosy.
5. To develop a compassionate attitude towards the patients and their attendants.

#### Skills

1. History taking in dermatology, sexually transmitted diseases and leprosy.
2. Clinical examination and description of cutaneous findings in a systematic way in dermatology, sexually transmitted diseases and leprosy.
3. To have a broad idea and approach to manage common skin diseases, sexually transmitted diseases and leprosy.
4. Systematic examination in relation to dermatologic diseases.
5. To develop skills to do day-to-day common laboratory tests and their interpretation which help in the diagnosis.

### COURSE CONTENT

1. Ineffective dermatoses: Pyoderma, tuberculosis and leishmaniasis- Etiology, Clinical features, Diagnosis and Treatment.

2. Infective dermatoses: Viral and fungal infections- Etiology, Clinical features, Diagnosis and Treatment.
3. Infestations: Scabies and pediculosis – Etiology, Clinical features, Diagnosis and Treatment.
4. Melanin synthesis: Disorders of pigmentation (Vitiligo, Chloasma / Melasma)- Etiology, Clinical features, Diagnosis and Treatment.
5. Allergic disorders: Atopic dermatitis and contact dermatitis – Etiology, Clinical features, Diagnosis and Treatment.
6. Drug eruptions, urticaria, erythema multiforme, Steven’s johnson syndrome and toxic epidermal necrolysis – Etiology, Clinical features, Diagnosis and Treatment.
7. Vesiculo-bullous diseases: Pemphigus, Pemphigoid, Dermatitis herpetiformis – Etiology, Clinical features, Diagnosis and Treatment.
8. Epidermopoiesis, Psoriasis, Lichen planus and Pityriasis rosea – Etiology, Clinical features, Diagnosis and Treatment.
9. Pathogenesis, Classification and clinical features of leprosy, Reactions in leprosy.
10. Diagnosis, treatment and control of leprosy.
11. Syphilis – Etiology, Clinical features, Diagnosis and Treatment.
12. Gonococcal and Non-gonococcal infections – Etiology, Clinical features, Diagnosis and Treatment.
13. Chancroid, LGV, Donovanosis, Herpes progenitalis – Etiology, Clinical features, Diagnosis and treatment.
14. Syndromic approach to the diagnosis and management of sexually transmitted diseases.
15. HIV infection, Cutaneous manifestations of HIV infection and their management.
16. Hereditary disorders: Ichthyosis, Albimism, Epidermolysis bullosa, Melanocytic naevi, Freckles and other naevi – Etiology, Clinical features, Diagnosis and Treatment.
17. Dermatological Emergencies.

## **Clinical Postings**

During the MBBS training period. The students will be posted in the OPD (Out Patient Department), specialty clinics and ward. They have the clinical teaching and demonstrations of all the common skin diseases sexually transmitted diseases, leprosy and common skin emergencies during this period. They also have orientation clinical posting during to familiarize them with the history taking, clinical examination and cutaneous lesions.

## **Demonstration**

The cases with diseases like acne vulgaris, scabies, pyoderma, pediculosis, fungal infection of skin, alopecias, sexually transmitted diseases, auto immune diseases, bullous disorders, papulosquamous disease etc. are demonstrated and discussed during the posting period.



# MEDICINE

## OBJECTIVES

The goal of the undergraduate training in general medicine is to provide such knowledge, skills and behavioral attribute that may enable the graduating physician to function effectively as a Primary Care Physician in a community setting. At the end of training, each student must be able to:

1. Understand the various manifestations of infectious and non-infectious diseases.
2. Understand the basic principle of history taking and clinical examinations.
3. Elicit a detailed history, perform a thorough physical examination including mental status examination and examination of an unconscious patient.
5. Correlate the clinical symptoms and physical signs to make a provisional anatomical, physiological, etiopathological diagnosis along with the functional disability and suggest relevant investigation.
6. Interpret reasonably the relevant investigations.
7. Professionally present and discuss the principles involved in the management of the patient, initiate first line management and outline short-term and long term management.
8. Manage acute medical emergencies like acute myocardial infarction, acute pulmonary oedema, acute anaphylactic and hypovolumic shock, status asthmaticus, tension pneumothorax, status epilepticus, hyperpyrexia, haemoptysis, gastro-intestinal bleeding, diabetic coma, electric shock, drowning, snake bites, common poisoning etc.
9. Acquire the skills to perform minor procedure under supervision like – IV cannulation, insertion of nasogastric tube, urinary bladder catheterisation, use of peak flow meter, doing an ECG etc.

## COURSE CONTENT

### General

The 'art' and 'science' of Medicine

Principles of medical ethics

Clinical diagnostic reasoning

Principles of prevention of disease

Clinical genetics - common types, clinical presentation, investigation and prevention of genetic diseases and genetic counseling

Medical disorders during pregnancy

Principles of Geriatric Medicine

Normal ageing

Clinical assessment of frail elderly,

Decisions about investigations and rehabilitation

Major manifestations of disease in elderly

Care of terminally ill/dying patient

### **Clinical Pharmacology**

Principles of drug therapy

Adverse drug reactions

Drug interactions

Monitoring drug therapy

Writing a drug prescription

### **Nutritional and metabolic disorders**

Nutritional assessment & needs

Nutritional & metabolic disorders

Protein energy malnutrition

Obesity

Vitamin and mineral deficiency & excess

Diet therapy including parenteral nutrition therapy

### **Water, electrolyte and acid-base imbalance**

Water and electrolyte  
physiology Acid-base disorders

Fluid and electrolyte disturbances

### **Critical care Medicine**

Physiology of the critically ill patient

Major manifestations of critical illness

Circulatory failure:  
shock Respiratory failure

Renal failure

Coma

Sepsis

Disseminated intravascular coagulation

General principles of critical care management

Scoring systems in critical care

Outcome and costs of intensive care

### **Pain management and palliative care**

General principles of pain

Assessment and treatment of pain

Palliative care

## Medical Psychiatry

Classification of psychiatric disorders

Aetiological factors in psychiatric disorders

The clinical interview and mental state examination

Major manifestations of psychiatric illness

Disturbed and aggressive behavior

Delusions and hallucinations

Depressive Symptoms

Anxiety symptoms

Deliberate self-harm and suicidal ideation Alcohol misuse and withdrawal

Misuse of drugs other than alcohol

Medically unexplained physical symptoms and functional somatic syndromes

Psychiatric and psychological aspects of chronic and progressive disease

Clinical syndromes

Organic brain syndromes

Substance abuse

- Alcohol

- Drugs

Bipolar disorders

Depressive disorders Schizophrenia

Treatments used in psychiatry Psychological treatments Physical treatments

Neurotic, stress-related and somatoform disorders

Anxiety

Obsessive compulsive disorders Dissociative disorders

Sleep disorders

Legal aspects of psychiatry

## Poisonings

General approach to the poisoned patient

Poisoning by specific pharmaceutical agents

Drugs of misuse

Chemicals and pesticides

Snake bite and Envenomation

Other bites and stings - scorpion, spider

### **Specific environmental and occupational hazards**

Heatstroke and hypothermia

Drowning and near drowning

Electrical injuries

Radiation injury

Heavy metal poisoning

### **Immune response and Infections**

Basic considerations

Patterns of infection

Laboratory diagnosis of infections

Principles of immunization and vaccine use

Clinical syndromes

The febrile patient

Fever and rash

Fever of unknown origin

Infective endocarditis

Intra-abdominal infections and abscesses

Acute infectious diarrhoeal diseases and food poisoning

Sexually transmitted diseases - overview & clinical approach

Infections of skin, muscle & soft tissues

Osteomyelitis

Hospital acquired infections

Infections in immuno-compromised hosts

### **Specific Infections - Epidemiology, clinical features, laboratory diagnosis, treatment and prevention of :**

Protozoal

infections

Amobiasis

Malaria

Leishmaniasis

Toxoplasmosis

Giardiasis

Trichomoniasis

Trypanosomiasis

Bacterial infections

Streptococcal infections

Pneumococcal infections

Staphylococcal infections

Meningococcal infections

Gonococcal infections

Legionella infections

Pertussis and Diphtheria

Tetanus

Botulism

Gas gangrene, other clostridial infections

Cholera

Salmonellosis - Typhoid and paratyphoid  
fevers Shigellosis and bacillary dysentery

Brucellosis

Plague

Donovanosis (Granuloma  
inguinale) Helicobacter Pylori

Infections due to pseudomonas & other gram - negative bacteria

Anaerobic infections

Mycobacterial

diseases

Tuberculosis

Leprosy

Viral infections

Common exanthemata

- Measles
- Mumps
- Rubella
- Varicella

Common viral respiratory infections

Human immunodeficiency virus (HIV)

Viral gastroenteritis

Dengue fever

Rabies

Rickettsia, Mycoplasma & Chlamydial diseases

Fungal infections

Candidiasis

Aspergillosis

Histoplasmosis

Cryptococcosis

Mucormycosis

Pneumocystis carinii

Helminthic infections

Nematodes

- Tissue
- Intestinal

Cestodes

- Tissue
- Intestinal

## **System-Based diseases**

### **Cardiovascular system**

Clinical examination of the cardiovascular system

Functional anatomy, physiology and investigations

Major manifestations of cardiovascular disease

Chest pain

Breathlessness

Palpitation

Acute circulatory failure (cardiogenic shock)

Heart failure Hypertension

Presyncope and syncope

Cardiac arrest and sudden cardiac death Abnormal heart sounds  
and murmurs Atrial fibrillation

Disorders of heart rate, rhythm and conduction Congestive cardiac failure

Rheumatic fever

Valvular heart disease Ischaemic heart disease

Congenital heart disease in the adult Cor pulmonale

Hypertension

Peripheral vascular disease Atherosclerosis

Pericardial disease

Myocarditis and cardiomyopathy

### **Respiratory system**

## Clinical examination of the respiratory system

Functional anatomy, physiology and investigations

Major manifestations of lung disease

Cough  
Dyspnoea

Chest pain  
Haemoptysis

The solitary radiographic pulmonary lesion  
Respiratory failure

Upper and lower respiratory infections  
Bronchial asthma

Chronic obstructive pulmonary disease  
Pulmonary tuberculosis

Suppurative lung diseases  
Bronchiectasis  
Lung abscess

Plural effusion and empyema

Interstitial and infiltrative lung diseases  
Occupational lung diseases

Tumors of the bronchus and lung  
Pulmonary vascular diseases

- Pulmonary hypertension

- Pulmonary thromboembolism  
Acute respiratory distress syndrome

Obstructive sleep apnoea

Diseases of the nasopharynx, larynx and trachea

Diseases of the mediastinum, diaphragm and chest wall

## Kidney and genitourinary system

Clinical examination of the kidney and genitourinary system

Functional anatomy, physiology and investigations

Major manifestations of renal and urinary tract disease

Dysuria, pyuria, urethral symptoms

Disorders of urine volume  
Haematuria

Proteinuria

Oedema

Obstruction of the urinary tract

Incontinence

Acute and chronic renal failure

Infections of the kidney and urinary tract

Congenital abnormalities of the kidneys and urinary system

Glomerulonephritides

Tubulo-interstitial diseases

Renal involvement in systemic disorders  
Drugs and the kidney

Renal vascular diseases

Urinary tract calculi and nephrocalcinosis

Tumors of the kidney and genitourinary tract

Renal replacement therapy

## Gastrointestinal tract

### Clinical examination of the abdomen

Functional anatomy, physiology and investigations particularly role of imaging, endoscopy and tests of function

Major manifestations of gastrointestinal disease Abdominal pain (acute and chronic)

Dysphagia

Dyspepsia

Vomiting

Constipation

Diarrhoea

Abdominal lump

Weight loss

Gastrointestinal bleeding - upper and lower

Approach to the patient with gastrointestinal disease

Diseases of the mouth and salivary glands - oral ulcers, candidiasis, parotitis

Diseases of the oesophagus - GERD, other motility disorders, oesophagitis, carcinoma oesophagus

Diseases of the stomach and duodenum - gastritis, peptic ulcer disease, tumors of stomach

Diseases of the small intestine

Acute gastroenteritis & food poisoning

Intestinal tuberculosis

Inflammatory bowel disease

Malabsorption syndrome

Tumors of small intestine

Acute, sub-acute and chronic intestinal obstruction

Disorders of the colon and rectum

Bacillary dysentery

Amoebic colitis

Ulcerative colitis

Tumors of the colon & rectum

Irritable bowel disease

Abdominal tuberculosis

- Peritoneal

- Nodal

- Gastrointestinal

Ischaemic gut injury

Anorectal disorders

Diseases of the peritoneal cavity

Acute and chronic  
peritonitis Ascites

Peritoneal carcinomatosis



## **Diseases of the pancreas**

Acute and chronic pancreatitis

Tumors of pancreas

## **Liver and Biliary tract disease**

Clinical examination of the abdomen for liver and biliary disease

Functional anatomy, physiology and investigations of hepatobiliary disease Major manifestations of liver disease

‘Asymptomatic’ abnormal liver function tests

Jaundice

Acute (fulminant) hepatic failure

Portal hypertension and ascites

Hepatic (portosystemic) encephalopathy

Hepatorenal failure

Liver abscess - amoebic & pyogenic

Viral hepatitis - acute and chronic

Alcoholic liver disease

Cirrhosis of liver and chronic liver disease Drugs, toxins and liver

Fatty liver and non alcoholic steatohepatitis Infiltrative diseases of liver

Wilson’s disease

Hemachromatosis

Tumors of the liver

Gallbladder and biliary tract diseases Functional anatomy

Acute and chronic ‘cholecystitis’

Cholelithiasis

Tumors of gall bladder and bile ducts

## **Endocrinology and Metabolism**

### **Diabetes mellitus**

Clinical examination of the patient with diabetes Epidemiology

Physiology, pathophysiology and investigations Aetiology and pathogenesis

Major manifestations of  
disease Hyperglycaemia

Acute metabolic complications

- Diabetic ketoacidosis
- Hyperglycemic non-ketotic coma
- Hypoglycemia

End organ damage

Management of diabetes

Long-term complications (micro and macrovascular)

Long-term supervision

Special problems in management

Prospects in diabetes mellitus

## **Thyroid gland**

Clinical examination of thyroid disease

Functional anatomy, physiology and investigations

Major manifestations of thyroid disease

Hyperthyroidism

Hypothyroidism

Thyroid enlargement

Abnormal thyroid function test results

## **The reproductive system**

Major manifestations of reproductive disease

Male hypogonadism

Gynaecomastia

Impotence

Short stature and delayed puberty

Cryptorchidism

Hirsutism

Secondary amenorrhoea

Infertility

## **The parathyroid glands**

Major manifestations of diseases of the parathyroid glands

Hypercalcemia

Hypocalcemia

## **The adrenal glands**

Major manifestations of adrenal disease  
 The 'Cushingoid' patient  
 Adrenal insufficiency  
 Pheochromocytoma

## **The endocrine pancreas and gastrointestinal tract**

Major manifestations of disease of the endocrine pancreas  
 Spontaneous hypoglycemia  
 Disorders affecting multiple endocrine system

## **The hypothalamus and the pituitary gland**

Major manifestations of hypothalamic and pituitary disease  
 Hypopituitarism  
 Visual field defects  
 Galactorrhea

## **Hematological disorders**

Clinical examination in blood disorders

Functional anatomy, physiology and investigations  
 Major manifestations of hematological diseases

Anaemia

Polycythemia

Leucopenia

Leucocytosis

Thrombocytopenia

Thrombocytosis

Pancytopenia

Lymphadenopathy

Splenomegaly

Bleeding

Venous thrombosis

Abnormal coagulation  
 screen Infections

Anemias

Myeloproliferative disorders

Haematological malignancies

Bleeding disorders

Disorders of coagulation and venous thrombosis

Blood products and transfusion

Bone marrow transplantation

## **Disorders of the immune system, connective tissue and joints**

Introduction to the immune system and autoimmunity

Primary immune deficiency diseases

HIV, AIDS and related disorders

Major manifestations of musculoskeletal disease  
Joint pains

Bone pain

Muscle pain and weakness

Regional periarticular pain

Back and neck pain

Approach to articular and musculoskeletal disorders

Inflammatory joint disease

Infectious arthritis

Inflammatory muscle disease

Osteoarthritis

Systemic connective tissue diseases - SLE, RA, PSS

Vasculitides

Ankylosing spondylitis, reactive arthritis and undifferentiated  
spondyloarthropathy Sarcoidosis

Amyloidosis

Musculoskeletal manifestations of disease in other systems

Fibromyalgia

Diseases of bone

## **Skin diseases**

Clinical examination of skin diseases

Major manifestations of skin disease

Various types of  
rash Pruritis

Erythroderma

Urticaria

Photosensitivity

Blisters  
 Leg ulcers  
 Alopecia  
 Acne

#### Approach to patient with skin disease

Some common skin infections and infestations - scabies, fungal infections, pyoderma  
 Eczema, psoriasis and other erythematous scaly eruptions  
 Cutaneous drug reactions  
 Disorders of pigmentation  
 Disorders of the nails

Skin manifestations of systemic diseases

### **Neurological diseases**

#### Clinical examination of nervous system

Functional anatomy, physiology and investigations

Major manifestations of nervous system disease

Headache and facial pain  
 Raised intracranial tension  
 Faintness, dizziness, syncope & vertigo  
 Sleep disorders  
 Disorders of movement  
 Ataxia  
 Sensory disturbances (numbness, tingling and sensory loss)  
 Acute confusional states

Coma and brain death

Aphasias and other focal cerebral disorders

Speech, swallowing and brain-stem disturbance  
 Visual disturbances

Sphincter disturbances

Migraine and cluster headaches

Seizures and epilepsy

Cerebrovascular disease

Dementias

Acute and chronic meningitis

Viral encephalitis

Diseases of cranial nerves

Intracranial tumours

Diseases of spinal cord

Multiple sclerosis and other demyelinating diseases

Parkinson's disease and other extrapyramidal disorders

Cerebellar disorders

Motor neuron disease

Peripheral neuropathy

Neurological manifestations of system diseases

Nutritional and metabolic diseases of the nervous system

Myasthenia gravis and other diseases of neuromuscular junction

Diseases of muscle

## OBSTETRICS & GYNAECOLOGY

The main goal of curriculum is to enable the undergraduate students to acquire the knowledge, skills and attitudes in the discipline of Obstetrics & Gynaecology as essential for a general practitioner.

### OBJECTIVES

The student should be able to:

- Make Diagnosis and organize management of antenatal, intranatal and postnatal period of normal and abnormal pregnancy;
- Provide adequate care of common gynae problems and emergencies
- Manage common gynae problems and emergencies
- Provide Counseling and delivery of fertility regulation methods.
- Acquire knowledge of methods of termination of pregnancy.
- Apply knowledge of vital statistics in obstetrics and RCH programme
- Develop communication skills.

### Practical & clinical training

- Students should be trained about proper history taking, clinical examination.
- Advicing relevant necessary investigations and their interpretation and management.
- Posting in OPD, wards, operation theaters, labor room and family planning clinics.
- Students should observe common OPD procedures like, E.A., D & C, MTP, Pap Smear, CuT insertion. Observe normal deliveries, forceps and ventouse assisted deliveries, cesrean section.
- Ligations, minilap procedures like abdominal, vaginal hysterectomy, foltergill repair.

### COURSE CONTENT

#### I Basic Sciences

1. Normal & abnormal development, structure and function of female & male urogenital systems and the female breast.
2. Applied anatomy of the genito-urinary system, abdomen, pelvis, pelvic floor, anterior abdominal wall, upper thigh (inguinal ligament, inguinal canal, vulva, rectum and anal canal).

3. Physiology of spermatogenesis.
4. Endocrinology related to male and female reproduction.
5. Anatomy & Physiology of urinary & lower GI (Rectum / anal canal), tract.
6. Development, structure & function of placenta, umbilical cord & amniotic fluid.
7. Anatomical & physiological changes in female genital tract during pregnancy.
8. Anatomy of fetus, fetal growth & development, fetal physiology & fetal circulation.
9. Physiological & neuro-endocrinal changes during puberty disorders, adolescence, menstruation, ovulation, fertilization, climacteric & menopause.
10. Gametogenesis, fertilization, implantation & early development of embryo.
11. Normal pregnancy, physiological changes during pregnancy, labour & puerperium.
12. Immunology of pregnancy
13. Lactation
14. Biochemical and endocrine changes during pregnancy, including systemic changes in cardiovascular, hematological, renal, hepatic and other systems. (Anaemia)
15. Biophysical and biochemical changes in uterus and cervix during pregnancy & labour.
16. Pharmacology of identified drugs used during pregnancy, labour, post partum period with reference to their mechanism of action, absorption, distribution, excretion, metabolism, transfer of the drugs across the placenta, effect of the drugs on the fetus, their excretion through breast milk.
17. Mechanism of action, excretion, metabolism of identified drugs used in Gynaecology, including chemotherapeutic drugs.
18. Role of hormones in Obstetrics & Gynaecology.
19. Markers in Obstetric & Gynaecology – Non neoplastic and Neoplastic Diseases.
20. Pathophysiology of ovaries, fallopian tubes, uterus, cervix, vagina and external genitalia in healthy and diseased conditions.
21. Normal and abnormal pathology of placenta, umbilical cord, amniotic fluid and fetus.
22. Normal and abnormal microbiology of the genital tract – bacterial, viral & parasitic infections responsible for maternal, fetal and gynaecological disorders.
23. Humoral and cellular immunology in Obstetrics & Gynaecology.

## **II Obstetrics**

1. Physiology of normal pregnancy, diagnosis of pregnancy, routine antenatal care, management of common symptoms in pregnancy, investigations to be carried out in pregnancy;
2. Drugs prescription during pregnancy and lactation
3. Hypertensive disorders in pregnancy
4. Anaemia in Pregnancy : Heart disease in pregnancy



5. Antepartum haemorrhage
6. Intrauterine Growth Restriction (IUGR)
7. Antenatal Fetal Surveillance
8. Rhesus Negative Pregnancy
9. Disorders of liver, kidneys in pregnancy
10. Multiple pregnancy
11. Puerperium, and its complications
12. Perinatal and maternal mortality in India

### **III Gynaecology**

1. Anatomy of fetal genital tract, and its variations, supports of uterus, developmental anomalies of uterus.
2. Ectopic pregnancy; epidemiology, early diagnosis and management.
3. Physiology of menstruation, common menstrual problem.
4. Disorders of growth, amenorrhoeas
5. Fibroid uterus
6. Prolapse uterus
7. Vaginal discharge, sexually transmitted diseases
8. Precancerous lesions of female genital tract (cervix, vagina, vulva)
9. Carcinoma Cervix, epidemiology, staging diagnostic procedure, treatment.
10. Carcinoma Endometrium
11. Carcinoma ovary
12. Carcinoma vulva
13. Gestational Trophoblastic disease
14. Temporary and permanent methods of contraception
15. Menopause and related problems
16. Endometriosis
17. Genital Tract Fistulae
18. Adolescence, Pubertal changes, disorders of puberty

### **IV Contraception, Neonatology and Recent Advances**

- (a) Contraception (Male & Female)
- (b) Medical terminal of pregnancy – safe abortion – selection of cases, technique & management of complication of medical and surgical procedures, MTP law Medical abortion & Emergency Contraception.

- (c) National health programmes.
- (d) Social obstetrics and vital statistics
- (f) Care of new born, neonatal resuscitation, detection of neonatal malformation. Neonatal sepsis – prevention, detection & management.
- (g) Neonatal hyper-bilirubinemia – investigation & management including NICU care.
- (h) Management of common neonatal problems
- (i) Ethics and medical jurisprudence

During this posting the students are expected to acquire competence in history taking and examination of the obstetrics and gynaecology patient.

the students are expected to gain increasing competence in making a diagnosis and planning the management of the patient. They will follow their allotted units. In addition there will be joint case discussion with the faculty by rotation.

### **In OPD**

They will take history and examination of + pelvic organs cases under the supervision of the competent / senior resident. They will learn to draw up a list of investigations and counsel the patient and also follow them up.

### **Minor OT**

They will assist in the performance of minor surgical procedures.

### **Wards**

They will be allocated beds and will be responsible for working up and following their patients.

### **Labour Room**

They will remain in the Labour Room in the evening and nights when their respective unit is on call. They will assist a minimum of 10 normal deliveries and witness 5 operative deliveries during each posting.

### **Main OT**

They will witness / assist major surgical procedures like abdominal and vaginal hysterectomy, laparoscopic surgery.

### **Family Planning**

Students will learn medical and surgical methods of contraception and sterilization procedure. They will learn to perform IUCD insertion and removal and minilap tubal ligation and vasectomy. They will assist 1<sup>st</sup> and 2<sup>nd</sup> trimester MTP procedure and urinary laparoscopic tubal sterilization.

## **Practical skills to be imparted during ward posting**

### **Obstetrics**

- a. History taking and examination of a pregnancy woman
- b. Watching progress of labour and conduct of a normal labour
- c. Management of third stage of labour, prevention and treatment of post partum haemorrhage
- d. Witness caesarean section, breech delivery, forceps and vacuum delivery
- e. Essential care of a newborn
- f. Non stress testing of fetus; biophysical scoring of fetus

### **Gynaecology**

- a. How to take history and examination of female pelvic organs
- b. Making of pap smear, wet smear preparation on vaginal discharge
- c. Minor gynaecologic procedures : cervical biopsy, endometrial biopsy, dilatation & curettage; fractional curettage
- d. Medical termination of pregnancy (MTP) : in first & second trimesters
- e. Insertion and removal of intrauterine contraceptive device

### **Operative Skills**

- a. Conduct of normal delivery
- b. Making and repair of episiotomy
- c. Insertion and removal of intrauterine device
- d. Making of pap smear
- e. Performing minilap tubectomy (under supervision)

### **Patient care in Wards**

1. Obstetric
2. Gynaecology
3. Emergency coverage or all patients with Obst/Gynae problems attending HIMS casualty on days the unit is on call. The same unit also provides emergency consultation for the HIMS hospital and attached centers who may require O & G Consultation during after office hours.

### **Patient Care in Labour Room**

Labour emergency coverage is done by each unit concerned from 8 a.m. – 5 p.m. after which the emergency unit “on call” provides intensive care duty. Labour Room duty on Sunday is on rotation.

### **Operation Theatres**

Each unit routinely has two days Main OT, 2 days Maternity OT and Interventional ultrasound OT, besides emergency OT patient care.

# OPHTHALMOLOGY

The broad goal of undergraduate teaching in ophthalmology is to provide such knowledge and skills to the student that shall enable him/her to practice as an internist and as a primary eye care physician, and also to function effectively as a community health leader to assist in the implementation of National Programme for the Prevention of blindness.

## OBJECTIVES

### Knowledge

At the end of the course, the student will have knowledge of :

1. Common problems affecting the eye
2. Magnitude of blindness in India and its main causes
3. Principles of management of major ophthalmic emergencies
4. Major systemic diseases affecting the eye
5. Effect of local and systemic diseases on the patient's vision and the necessary action required to minimise the sequelae of such diseases
6. Adverse drug reactions with special reference to ophthalmic manifestations
7. National programme for prevention of blindness and its implementation at various level
8. Eye care education for prevention of eye problems
9. Role of Primary Health Centres
10. Organisation of primary health care and the functioning of the Ophthalmic assistant
11. Integration of the National programme for control of blindness with the other National health programmes
12. Eye bank organisation

### Skills

At the end of the course, the student will be able to:

1. Elicit a history pertinent to general health and ocular status
2. Perform diagnostic procedures such as visual acuity testing, examination of the eye, tonometry, staining for corneal pathology, confrontation perimetry, subjective refraction including correction for presbyopia and aphakia, direct ophthalmoscopy, conjunctival smear examination and cover test
3. Diagnose and treat common problems affecting the eye

4. Interpret ophthalmic signs in relation to common systemic disorders
5. Perform therapeutic procedures such as subconjunctival injection, corneal/conjunctival foreign body removal, carbolic cautery for corneal ulcers, nasolacrimal duct syringing and tarsorrhaphy
6. Provide first aid in major ophthalmic emergencies
7. Organise community surveys for visual health
8. Organise primary eye care services through Primary Health Centres
9. Use effective means of communication with the public and individuals to motivate them for surgery for cataract, glaucoma etc and for eye donation
10. Establish rapport with his seniors, colleagues and paramedical workers, so as to effectively function as a member of the eye care team

### **Teaching program**

Teaching programs are regularly updated to include newer developments. As of now the program is :

### **Didactic lectures**

1. Microbiology in relation to eye
2. Pathology in relation to eye
3. Pharmacology in relation to eye
4. Symptomatology in Ocular disorders and their Pathogenesis
5. Ocular involvement in systemic diseases
6. Disorders of the Lid
7. Disorders of the Lacrimal Apparatus
8. Conjunctivitis & Ophthalmia Neonatorum
9. Trachoma & Other chronic conjunctivitis
10. Keratitis and corneal ulcers
11. Corneal ulcer
12. Scleritis & Episcleritis
13. Refractive Errors & Method of correction
14. Presbyopia, accommodation convergence
15. Congenital cataract
16. Senile cataract
17. Metabolic & complicated cataract
18. Primary Angle closure glaucoma
19. Congenital glaucoma
20. Primary Open angle glaucoma
21. Secodary glaucomas

22. Anterior uveitis
23. Posterior uveitis
24. Blindness prevalence, prevention & rehabilitation
25. Retinopathies, Hypertensive, Toxaemia & Pregnancy
26. Diabetic Retinopathy
27. Retinal Detachment, types, symptoms & pre-disposing factors
28. Endocrine ophthalmology
29. Retinal vascular disorders
30. Retinoblastoma & other ocular neoplasms
31. Binocular vision amblyopia & concomitant squint
32. Nutritional disorders
33. Incomitant strabismus
34. Visual acuity, pupillary path ways & cranial nerve palsies
35. Optic nerve lesions
36. Ocular emergencies (Traumatic)
37. Ocular emergencies (Non-Traumatic)
38. Minor ophthalmic surgery
39. General principles of Intra ocular surgery
40. National programme for control of blindness
41. Comprehensive eye care in rural set up
42. Eye banking & ethics in ophthalmology

### **Clinical ward teaching**

1. Trachoma
2. Entropion / ectropion
3. Pterygium
4. NLD block / Dacryocystitis
5. Conjunctivitis / allergic / acute
6. Corneal ulcer
7. Keratitis
8. Iridocyclitis
9. Angle closure glaucoma
10. Scleritis / episcleritis
11. Dark room
12. Refractive errors & presbyopia
13. Cataract – senile

- a. Complicated
  - b. Post operative
  - c. Complications
  - d. Intraocular lenses
14. Basic sciences (Microbiology, Pharmacology, Pathology)
  15. Casualty & minor O.T. I
  16. Open angle glaucoma
  17. Xerophthalmia
  18. Corneal opacities
  19. Ocular injury
  20. Perforating / concussion injuries
  21. Amaurosis fugax
  22. Diabetic retinopathy
  23. Hypertensive retinopathy
  24. Anemic and other retinopathies
  25. Indirect ophthalmoscopy
  26. Orthoptics
  27. Concomitant squint
  28. Paralytic squint
  29. Surgical Instruments

# ORTHOPAEDICS

An MBBS student should know about the commonly encountered conditions in orthopaedics pertaining to their diagnostic features, basic pathophysiological aspect and the general and basic management strategies. It is expected to learn basic skills such as application of splints, skin and skeletal traction, as well as plaster slab and casts (including special casts such as CTEV cast, hip spica, shoulder spica, cylinder cast, patellar tendon bearing casts).

An MBBS student should know the maneuvers for reduction of common fractures and dislocations such as Colles' fracture, supracondylar fracture of humerus, dislocation of shoulder, elbow and hip etc.

## OBJECTIVES

1. Embryology, applied anatomy, physiology, pathology, clinical features, diagnostic procedures and the principles of therapeutics including preventive methods, (medical/surgical) pertaining to musculo-skeletal system.
2. Clinical decision making ability & management expertise: Diagnose conditions from history taking, clinical evaluation and investigations and should be able to distinguish the traumatic from infective and neoplastic disorders.
3. Thrust areas
  - a) Pediatric orthopaedics- The student should be exposed to common congenital and developmental disorders such as CTEV (club-Foot), developmental dysplasia of hip, Perthe's disease and infections, and also should acquire adequate knowledge about the principles of management of these disorders.
  - b) Orthopaedic oncology- The undergraduate is expected to be familiar with the common tumours encountered in orthopaedic practice. The student should be able to diagnose common bone tumors and should know principles of treatment
  - c) Management of Trauma- Trauma in this country is one of the main causes of morbidity and mortality in our demographic statistics. The student is expected to be fully conversant with trauma in its entirety including basic life saving skills, control of hemorrhage, splintage of musculoskeletal injuries and care of the injured spine.
  - d) Sports Medicine- The student should know about common orthopaedic pathologies encountered in sportspersons and their diagnostic and preventive aspects.
  - e) Physical Medicine and Rehabilitation- The student is expected to be familiar with common orthotic and prosthetic devices and their applications.
  - f) Orthopedic Neurology- The student should be exposed to all kinds of nerve injuries as regards their recognition & principles of management, cerebral palsy and acquired neurologic conditions such as post polio residual paralysis.
  - g) Disorders of Spine - The student is expected to be familiar with various kinds of spinal disorders such as scoliosis, kypho-scoliosis, spinal trauma, prolapsed intervertebral disc and infections (tuberculosis and pyogenic) as regards their clinical presentations and principles of management.



- h) Radiology- Acquire knowledge about radiology/imaging and should be able to interpret radiographs typical of common orthopaedic pathologies.
4. Patient doctor relation: UG should learn the skills to communicate with the patient and his/her relatives pertaining to the disease condition, its severity and options available for the treatment/therapy.
  5. Preventive Aspect: Undergraduate should acquire knowledge about prevention of some conditions especially in children such as poliomyelitis, congenital deformities, cerebral palsy and common orthopaedic malignancies.

## **TEACHING LEARNING ACTIVITIES**

### **Didactic Lectures**

UG will attend didactic lectures on the following topics.

- Fracture: Definition, Classification, Principles of Management
- Fracture healing, delayed union
- Classification & Management of open fractures
- Management of fracture clavicle, dislocation shoulder & fracture shaft humerus
- Classification of injuries around elbow & management of supracondylar fracture & dislocation of elbow
- Monteggia fracture dislocation & fracture both bones of forearm
- Volkamann's Ischaemic Contracture
- Fracture of lower end of radius fracture scaphoid and metacarpals
- Fracture pelvis & dislocation of hip
- Fracture neck of femur
- Fracture shaft of femur & tibia
- Internal Derangements of Knee, Injuries of ankle & foot
- Amputations
- Congenital malformations: CTEV Torticollis
- Congenital Malformation : CDH, Pseudoarthrosis tibia etc.
- Disorders of the hip : coxa vara, perthes diseases
- Deformities of the spine
- Acute Pyogenic Osteomyelitis
- Chronic Pyogenic Osteomyelitis
- Septic Arthritis
- Other Arthritides (Rheumatoid/Ank.Spond.)
- Osteo-articular tuberculosis:
- General consideration & principles of management

- Tuberculosis: Spine
- Poliomyelitis
- Bone Tumours: Benign tumors
- Bone Tumours: Malignant tumors

**Integrated Seminars** – Combined interdisciplinary seminars on subjects like Arthritis, Tuberculosis, Osteoporosis etc.

## **ACQUISITION OF BASIC ORTHOPAEDIC SKILLS**

The undergraduate learns:

- Application of splints and tractions
- Application of plaster. Slabs and casts
- Manipulative reduction of common fractures and dislocations.
- Infiltration of tender periarticular lesions.
- Aseptic technique of joint fluid aspiration.

# OTORHINOLARYNGOLOGY

During under graduate course, the students should learn the principles of examination and management of common Ear , Nose and throat diseases and acquire adequate skills to manage common diseases like CSOM , tonsillitis common emergencies like upper airway obstruction and peritonsillar abscess and be able to refer the complicated cases to an appropriate specialist

## OBJECTIVES

At the end of the otorhinolaryngology posting. The student shall be able to

1. Examine and diagnosis common ear, nose, and throat problems
2. Suggest common investigative procedures and their interpretation to diagnose and manage the patient.
3. Treat the common ear, nose, throat and neck problem at primary care centre, while treating the patient. He should know the rational use of commonly used design with their adverse effects.
4. Train to perform various minor surgical procedures like ear syringing nasal packing and biopsy procedure.
5. Assist common surgical procedures such as tonsillectomy, mastoidectomy, septoplasty, tracheostomy and endoscopic removal of foreign bodies.
6. Have awareness of Preventive otology and head & neck cancer for public guidance.

**Clinical Training:** The students would be posted in the ENT department (**OPD** and Ward) for a total period of 2 months on rotation basis . Here they would learn the basic ENT examination, become familiarised with diagnosing the common ENT diseases and learning the elementary management, including communication skills.

The clinical training would consist of

- 1) two classes on introduction to the clinical aspects of ENT including proper Ear , Nose and throat examination
- 2) Bed side teaching and case discussion on common ENT conditions like CSOM, Deviated Nasal septum, Nasal polyps, Cancer larynx etc
- 3) Orientation to commonly used ENT instruments and X-Rays in ENT practice
- 4) Exposure to commonly done OPD procedures like nasal packing , ear packing, cautery etc
- 5) Exposure to selective operative procedures like tracheostomy, tonsillectomy , septoplasty, Nasal polypectomy etc
- 6) Preventive Otology and head & neck cancer.

## Theory

The formal lecture schedule for the MBBS students would be held in the 6<sup>th</sup> and 8<sup>th</sup> semesters and would consist of 1 hour lectures.

## Schedule for 6<sup>th</sup> semester

1. Introduction to Ear, Nose, Throat and Head & Neck Surgery.
2. Acute and chronic Rhino sinusitis, Nasal polyp Fungal disease of Nose.
3. Secretary Otitis Media, Acute suppurative otitis media. Acute mastoiditis and its treatment.
4. Classification of CSOM, pathogenesis of cholesteatoma. Conservative management of CSOM, underlying principles of myringoplasty, ossiculoplasty, tympanoplasty, radical and modified mastoidectomy.
5. Complications of CSOM and their management.
6. Otospongiosis, tympanosclerosis, adhesive otitis media. Prevention of deafness. Voice and speech disorders including stammering.
7. Epistaxis: causes and management. Principles of management in maxillofacial trauma. Maxillary and Nasal bone fractures. CSF Rhinorrhoea.
8. Lesions of the nasal septum-perforation, haematoma, DNS, nasal deformities and their management, including rhinoplasty, choanal atresia.
9. Benign and malignant tumours of the maxilla – diagnosis and management. Differential diagnosis and management of a maxillary swelling and of a mass in the nasal cavity.

## Schedule for 7<sup>th</sup> Semester students session

1. Causes of facial paralysis and their management. Tumours of temporal bone acoustic neuroma, glomus Jugulare.
2. Clinical evaluation of vertigo
3. Rhinitis, rhinosporidiosis rhinoscleroma, midline granuloma, Wegener's granulomatosis, leprosy and tuberculosis of nose.
4. Anatomy of neck spaces. Tumours and infections of retropharyngeal space and parapharyngeal spaces. Ludwig's angina. Neurological disorders of the larynx.

## COURSE CONTENT

**Nose:** Deviated nasal septum, nasal polypi, angiofibroma. Tumours both benign and malignant, chronic granulomatous disease? Nose like rhinospondiosis and atrophic rhinitis.

### Oral cavity and oropharynx

Tonsillitis, leukoplakia, carcinoma aphthous ulcers, pharyngitis, peritonsillar abscess, candidiasis.

### Ear

Perichondritis, otitis externa, secretory, otitis media, acute suppurative otitis media, chronic suppurative otitis media (safe and unsafe), benign and malignant tumors of ear, larynx, vocal cord nodule, vocal polyp, carcinoma, vocal cord palsy.

**Hypopharynx :** Benign and malignant disease.

**Neck :** Lymphadenitis, metastatic neck benign and malignant tumors of neck, bronchial sinus,

branchially pyroid tumors, salvary gland tumors.

**Emergencies :** Respiratory obstruction foreign bodies in nose, ear, throat, trachobroncheal tree and esophagus nasal bleeding, trauma to neck.

### **Instruments**

- Thudicum nasal speculum.
- Killiani self retaining nasal speculum
- Tielley lichwitz antrum puncture trocar and cannula
- Higginson's rubber syringe
- Ballenger's swivet knife
- Walsham's forceps
- Luis forceps
- Tilley's forceps
- St clair thomson post nasal mirror
- Simpson's antral syringe
- Jobson homes probe and ring curette
- Siegle pneumatic speculum
- Tuning fork
- Barany noise box
- Head mirror
- Toynbee ear speculum
- Boyle Davis mouth gag
- Lack's tongue depressor
- Draffins bipod metallic stand
- Eve's tonsillar snare
- St Clare Thomson Adenoid curette with / without cage
- Trousseau's trocheal dilator
- Jackson's metallic tracheostomy tube
- Direct laryngoscope
- Chevalier Jackson's oesophagoscope
- Negus bronchoscope

### **Operative Procedures**

- Tonsillectomy
- Adenoidectomy
- Septoplasty
- Caldwell-Luc operation

- Myringoplasty
- Modified radical mastoidectomy
- Radical mastoidectomy
- Biopsy for diagnosis of carcinoma of tongue, etc
- Direct laryngoscopy
- Neck node biopsy

### **X-ray**

- X-ray paranasal sinus
  - Water's view
  - Caldwell view
  - Lateral view
- X-ray nasopharynx – lateral view
- X-ray mastoid
  - Oblique lateral view
  - Town's view
- X-ray neck
  - Lateral view
  - Anteroposterior view

## PEDIATRICS

The course includes systematic instructions in growth and development, nutritional needs of a child, immunization schedules and management of common diseases of infancy and childhood, scope of Social Pediatrics and counselling.

### OBJECTIVES

The broad goals of the teaching of undergraduate students in Pediatrics are to acquire knowledge and appropriate skills for optimally dealing with major health problems of children and to ensure their optimal growth and development.

#### Knowledge

At the end of the course, the student shall be able to:

- (a) Describe the normal growth and development during fetal life, neonatal period, childhood and adolescence and outline deviations thereof;
- (b) Describe the common pediatrics disorder and emergencies in terms of epidemiology, etiopathogenesis, clinical manifestations, diagnosis, rational therapy and rehabilitation;
- (c) State age related requirements of calories, nutrients, fluids, drugs etc. in health and disease;
- (d) Describe preventive strategies for common infectious disorders, malnutrition, genetic and metabolic disorders, poisonings, accidents and child abuse;
- (e) Outline national programmes relating to child health including immunization programmes;

#### Skills

At the end of the course, the student shall be able to:

- (a) Take a detailed pediatrics history, conduct an appropriate physical examination of children including neonates, make clinical diagnosis, conduct common bedside investigative procedures, interpret common laboratory investigations and plan and institute therapy;
- (b) Take anthropometric measurements, resuscitate newborn infants with bag and mask at birth, prepare oral rehydration solution, perform tuberculin test, administer vaccines available under current national programmes, start an intravenous line and provide naso-gastric feeding, observe venesection and intra-osseous infusion if possible.
- (c) Conduct diagnostic procedures such as lumbar puncture, bone marrow aspiration, pleural tap and ascitic tap; observe liver and kidney biopsy.

- (d) Distinguish between normal newborn babies and those requiring special care and institute early care to all new born babies including care of pre-term and low birth weight babies, provide correct guidance and counselling in breast-feeding.
- (e) Provide ambulatory care to all sick children, identify indications for specialized/inpatient care and ensure timely referral of those who require hospitalization.

## **Integration**

The training in pediatrics should be done in an integrated manner with other disciplines, such as Anatomy, Physiology, Forensic Medicine, Community Medicine, Obstetrics and Physical Medicine, curative and rehabilitative services for care of children both in the community and at hospital as part of a team.

## **COURSE CONTENT**

### **Vital statistics**

- Definition and overview of Pediatrics with special reference to age-related disorders. Population structure, pattern of morbidity and mortality in children.
- Maternal, perinatal, neonatal, infant and preschool mortality rates. Definition, causes, present status and measures for attainment of goals.
- Current National programmes such as ICDS, RCH, Vitamin A prophylaxis, UIP, Pulse polio, AFP, ARI, Diarrhea control programme etc., IMCI
- Other National Programmes

### **Growth and development**

- Normal growth from conception to maturity.
- Anthropometry – measurement and interpretation of weight, length/height, head circumference, mid-arm circumference. Use of weighing machines, infantometer
- Interpretation of Growth Charts: Road to Health card and percentile growth curves.
- Abnormal growth patterns – failure to thrive, short stature.
- Growth pattern of different organ systems such as lymphoid, brain and sex organs.
- Normal pattern of teeth eruption.
- Principles of normal development
- Important milestones in infancy and early childhood in the areas of Gross Motor, Fine Motor, Language and Personal–Social development. 3-4 milestones in each of the developmental fields, age of normal appearance and the upper age of normal psychological and behavioral problems.
- Measurement and interpretation of sitting height, US: LS ratio and arm span.
- Age-independent anthropometric measurement-principles and application.

### **Nutrition**

- Normal requirements of protein, carbohydrates, fats, minerals and vitamins for newborn, children and pregnant and lactating mother. Common food sources.



- Breast feeding, physiology and lactation, composition of breast milk, Colostrum, Initiation and technique of feeding. Exclusive breast milk. Hazards and demerits of prelacteal feed, top milk and bottle-feeding. Feeding of LBW babies.
- Infant feeding/weaning foods, method of weaning.
- Assessment of nutritional status of a child based on history and physical examination.
- Protein energy malnutrition-Definition, classification according to IAP/Wellcome Trust, acute versus chronic malnutrition. Clinical features of Marasmus & kwashiorkor. Causes and management of PEM including that of complications planning a diet for PEM.
- Vitamins-Recognition of vitamin deficiencies (A, D, K, C, B Complex). Etiopathogenesis, clinical feature, biochemical and radiological findings, differential diagnosis and management of nutritional rickets & scurvy. Hypervitaminosis A and D.
- Characteristics of transitional and mature milk (foremilk & hind milk). Prevention and management of lactation failure and feeding problems.
- Definition, causes and management of obesity.

## **Immunization**

- National Immunization Programme.
- Principles of Immunization. Vaccine preservation and cold-chain.
- Types, contents, efficacy storage, dose, site, route, contra-indications and adverse reactions of vaccines – BCG, DPT, OPV, Measles, MMR and Typhoid: Rationale and methodology of Pulse Polio Immunization.
- Investigation and reporting of vaccine preventable diseases. AFP (Acute Flaccid Paralysis) surveillance
- Special vaccines like Hepatitis B, H influenza B, Pneumococcal, Hepatitis A, Chicken pox, Meningococcal, and Rabies.

## **Infectious diseases**

- Epidemiology, basic pathology, natural history, symptoms, signs, complications, investigations, differential diagnosis, management and prevention of common bacterial, viral and parasitic infections in the region, with special reference to vaccine-preventable disease: Diarrhea, LRTI, Tuberculosis, Poliomyelitis, Meningitis, Diphtheria, Whooping cough, Tetanus including neonatal tetanus, Measles, Mumps, Rubella, Typhoid, Viral Hepatitis, Cholera, Chickenpox, Giardiasis, Amoebiasis, Intestinal helminthiasis, Malaria, Dengue fever, AIDS.
- Kala-Azar, Leprosy, Chlamydia infection

## **Hematology**

- Causes of anemia in childhood. Classification based on etiology and morphology.
- Epidemiology, recognition, diagnosis, management and prevention of nutritional anemia-iron deficiency, megaloblastic.
- Clinical approach to a child with anemia with lymphadenopathy and/or hepato-splenomegaly.

- Epidemiology, clinical features, investigations and management of Thalassemia.
- Approach to a bleeding child.
- Diagnosis of acute lymphoblastic leukemia and principles of treatment.
- Clinical features and management of hemophilia, ITP.
- Diagnosis and principles of management of lymphomas.
- Types, clinical features and management of acute hemolytic anemia.
- Non-thrombocytopenic purpura (Henoch-Schonlein purpura)

## **Respiratory system**

- Clinical approach to a child with cyanosis, respiratory distress, wheezing. Significance of recession, retraction.
- Etiopathogenesis, clinical features, complications, investigations, differential diagnosis and management of acute upper respiratory infections, pneumonia with emphasis on bronchopneumonia, bronchiolitis, bronchitis. Acute and chronic otitis media.
- Etiopathogenesis, clinical features, diagnosis, classification and management of bronchial asthma. Treatment of acute severe asthma.
- Pulmonary tuberculosis-tuberculous infection versus tuberculous disease, difference between primary and post-primary tuberculosis. Etiopathogenesis, diagnostic criteria in children versus adults. Diagnostic aids-technique and interpretation of Mantoux test and BCG test. Radiological patterns, Chemoprophylaxis and treatment.
- Diagnosis and management of foreign body aspiration. Differential diagnosis of stridor.
- Pathogenesis, clinical features and management of pneumothorax, pleural effusion and empyema.
- Multidrug resistant tuberculosis, Bronchiectasis, pulmonary cysts

## **Gastro Intestinal Tract**

- Clinical approach to a child with jaundice, vomiting, abdominal pain, upper and lower GI bleeding, hepato-splenomegaly.
- Acute diarrheal disease-Etiopathogenesis, Clinical differentiation of watery and invasive diarrhea, complications of diarrheal illness. Assessment of dehydration, treatment at home and in hospital. Fluid and electrolyte management. Oral rehydration, composition of ORS.
- Persistent and chronic diarrhea
- Clinical features and management of acute viral hepatitis and acute liver failure, causes & diagnosis of Chronic Liver Disease.
- Neonatal cholestasis, portal hypertension
- Common causes of constipation.
- Abdominal tuberculosis.
- Causes, clinical features and management of Portal hypertension, Reye's syndrome, Celiac disease.
- Drug induced hepatitis

## Central Nervous System

- Evaluation of milestones and developmental age
- Localization of neurological deficit
- Clinical approach to a child with coma, mental retardation
- Common causes and approach to convulsion
- Clinical diagnosis, investigations and treatment of acute pyogenic meningitis, encephalitis & Tubercular Meningitis, Cerebral Malaria
- Seizure Disorder-Causes and types of convulsions at different ages. Diagnosis categorization & management of Epilepsy (Broad outline). Febrile convulsions-definition, types Management of seizures and status epilepticus.
- Causes, diagnosis and management of cerebral palsy.
- Acute flaccid paralysis – Differentiation between Polio and Guillain – Barre syndrome.
- Microcephaly, Hydrocephalus, chorea
- Counseling parents for inherited neurological diseases
- Infantile tremor syndrome, infantile hemiplegia

## Cardiovascular system

- Clinical features, diagnosis, investigation, treatment and prevention of acute rheumatic fever. Common forms of rheumatic heart disease in childhood. Differentiation between rheumatic and rheumatoid arthritis.
- Recognition of congenital acyanotic and cyanotic heart disease. Hemodynamics, clinical features and management of VSD, PDA, ASD and Fallot's tetralogy (Cyanotic spells).
- Recognition of congestive cardiac failure in children.
- Hypertension in children-recognition and referral.
- Diagnosis and management of bacterial endocarditis, pericardial effusion, myocarditis.

## Genito-Urinary system

- Basic etiopathogenesis, clinical features, diagnosis, complications and management of acute post-streptococcal glomerulo-nephritis and nephrotic syndrome.
- Etiology, clinical feature, diagnosis and management of urinary tract infection – acute and recurrent.
- Etiology, diagnosis and principles of management of acute failure.
- Causes and diagnosis of obstructive uropathy in children.
- Diagnosis and principles of management of chronic renal failure.
- Causes and diagnosis of hematuria.
- Renal and bladder stones
- Hemolytic-uremic syndrome

## Endocrinology

- Etiology clinical features & diagnosis of diabetes and hypothyroidism, hyperthyroidism and goiter in children.
- Delayed and precocious puberty

## Neonatology

- Definition – live birth, neonatal period, classification according to weight and gestation, mortality rates.
- Delivery room management including neonatal resuscitation and temperature control
- Etiology, clinical features, principles of management and prevention of birth asphyxia.
- Birth injuries – causes and their recognition.
- Care of the normal newborn in the first week of life. Normal variations and clinical signs in the neonate.
- Breast feeding-physiology and its clinical management
- Identification of congenital anomalies at birth with special reference to anorectal anomalies, tracheo-esophageal fistula, diaphragmatic hernias, neural tube defects.
- Neonatal Jaundice: causes, diagnosis and principles of management.
- Neonatal infection– etiology, diagnosis, principles of management. Superficial infections, sepsis.
- Low birth weight babies-causes of prematurity and small-for-date baby, clinical features and differentiation. Principles of feeding and temperature regulation. Problems of low birth weight babies.
- Identification of sick newborn (i.e. detection of abnormal signs – cyanosis, jaundice, respiratory distress, bleeding, seizures, refusal to feed, abdominal distension, failure to pass meconium and urine)
- Recognition and management of specific neonatal problems-hypoglycemia, hypocalcemia, anemia, seizures, necrotizing enterocolitis, hemorrhage
- Common intra-uterine infections
- Transportation of a sick neonate.

## Pediatrics Emergencies

- Status epilepticus
- Status asthmaticus/Acute Severe Asthma
- Shock and anaphylaxis.
- Burns
- Hypertensive emergencies.
- Gastrointestinal bleed.
- Comatose child

- Congestive cardiac failure
- Acute renal failure

### **Fluid-Electrolyte**

- Principles of fluid and electrolyte therapy in children
- Pathophysiology of acid-base imbalance and principle of management

### **Genetics**

- Principles of inheritance and diagnosis of genetic disorders
- Down's syndrome

### **Behavioral Problems**

- Breath holding spells, nocturnal enuresis, temper tantrums, pica

### **Pediatrics Surgical Problems**

- Diagnosis and timing of surgery of Cleft lip/palate, hypospadias, undescended testis, tracheo-esophageal fistula, hydrocephalus, CTEV, Umbilical and inguinal hernia, malformations, hypertrophic pyloric stenosis.

### **Therapeutics**

- Pediatric doses, drug combinations, drug interactions, age specific choice of antibiotics.

## **TEACHING AND LEARNING ACTIVITIES**

Teaching in the department will include didactic lectures and practical training.

### **Didactic Lectures**

1. Introduction to child health and age related influences on child health
2. Growth: Principles, Normal pattern, clinical indices and use of growth charts
3. Growth: Abnormal, etiology and approach to management
4. Development: Principles and normal milestones
5. Abnormal development: etiology and management
6. Protein energy malnutrition: Etiology, classification, clinical features, management
7. Clinical aspects of fluid and electrolyte balance in children
8. Common vaccines: doses, schedule, contraindications and side effects
9. Approach to a child with shock
10. Approach to a child with acute fever
11. Deficiency disorders of vitamins and micro-nutrients
12. Approach to a child with acute diarrhea, dehydration and ORS
13. Persistent diarrhea: etiology, clinical features and management. Dietary therapy in chronic diarrhea
14. Approach to management of common abdominal symptoms -pain, vomiting, constipation, rectal

bleeding etc

15. Approach to a child with upper respiratory tract infection (LTB, epiglottitis, otitis media, cough and cold)
16. Approach to a child with lower respiratory infection (pneumonia, bronchiolitis)
17. Approach to a child with wheezing including asthma
18. Introduction to newborn care, and classification of neonates.
19. Care of normal newborn
20. Breast feeding , weaning diets and lactation failure
21. Approach to a newborn with respiratory distress
22. Approach to jaundice in the newborn
23. Infections in the newborn
24. Perinatal asphyxia: etiology, clinical features and management
25. Approach to a child with bleeding & coagulation disorders
26. Approach to a child with malignancy
27. Approach to a child with congestive cardiac failure
28. Rheumatic fever: clinical features, management and prophylaxis
29. Approach to a child with congenital heart disease
30. Approach to a child with urinary tract infection including recurrent UTI
31. Approach to a child in coma
32. Approach to a child with acute flaccid paralysis
33. Neonatal seizures and febrile convulsions diagnosis and management
34. Approach to common genetic disorders including Downs Syndrome
35. Short stature, hypothyroidism: etiology and management
36. Adolescent growth, sexual maturation and disorders of Puberty

### **Learning objectives (Skills)**

1. Taking a detailed Pediatric history
2. Conducting physical examination of children
3. Understanding normal growth and development
4. Performing anthropometry and its interpretation
5. Developmental assessment of a child
6. Assessment of calorie/ protein intake and advise regarding feeding practice
7. Immunization schedule and administration
8. Evaluation and management of common OPD conditions
9. Medical conduct during patient examination
10. Care of normal newborn at birth and lying in ward

11. Counseling for breast feeding/ infant feeding
12. Evaluation and management of common fluid and electrolyte problems
13. Evaluation and management of common conditions related to Infectious diseases, Adolescent pediatrics, Respiratory tract, GI tract and Cardiovascular system.

### **Clinical OPD cases (9.00 am – 12.00 Noon)**

1. Tutorials and demonstration for first one week
2. Case discussion of common OPD conditions

### **Subjects for Tutorials cum demonstration**

1. History taking I (Present, past and family)
2. History taking II (Antenatal, development, immunization, feeding)
3. General physical examination and Anthropometry
4. Developmental examination and interpretation of abnormal development
5. Assessment of nutritional intake and nutritional advice
6. Demonstration of BCG, OPV, DPT and Measles vaccination, Mx testing

### **List of OPD cases for discussion**

1. Approach to a child with acute fever (evaluation and management of common febrile conditions including viral fever, enteric fever, malaria, UTI)
2. Approach to a child with chronic fever (evaluation and management of pulmonary tuberculosis)
3. Common viral exanthems including measles and chicken pox.
4. Common skin conditions including pyoderma, scabies
5. Common GI conditions including acute gastroenteritis, persistent diarrhea and infective hepatitis
6. Common respiratory conditions including viral URI, bacterial pharyngitis, laryngeal stridor and croup, acute lower respiratory tract infection (LRTI) and asthma.
7. Common CNS conditions including febrile seizures, epilepsy, developmental delay
8. Evaluation of normal infants for growth and development and advice regarding nutrition and immunization

### **Clinical case discussion**

#### **A. Neonatology**

1. Neonatal history
2. Examination of newborn
3. Care of normal newborn at birth and lying in ward
4. Breast feeding
5. Management of common neonatal problems

## **B. Pediatrics**

Clinical case discussion with emphasis on history taking, physical examination, nutrition and developmental assessment, differential diagnosis, investigations and management.

### **Subjects for tutorials/ demonstration**

1. Newborn resuscitation
2. Common vaccines used in Pediatrics
3. Malnutrition and Vitamin deficiencies
4. National Health programmes specifically ICDS, DOTS, RCH and IMCI

### **Learning Objectives (skills)**

1. Re-emphasis on taking a detailed Pediatric history, conducting an appropriate physical and development examination of children including neonates, making a clinical diagnosis, interpreting common laboratory results and planning therapy
2. Evaluation and management of emergencies including neonatal and pediatric resuscitation
3. Management of neonates requiring special care (including low birth weight and preterm babies)
4. Exposure to diagnostic and therapeutic procedures such as intravenous access, naso-gastric feeding, venesection, pleural tap, ascitic tap, bone marrow aspiration, lumbar puncture, liver and kidney biopsy
5. Prescription writing for common disorders of childhood.



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# PSYCHIATRY

## BEHAVIOURAL SCIENCES –

### OBJECTIVES

At the end of the course, the student will be able to:

1. Understand human behaviour and its application in patient care.
2. Understand the concept of motivation, its impact on human behaviour and illness related behaviour.
3. Understand different types of emotions and their impact on health of the individual.
4. Define learning, comprehend different types of learning and conditioning. State methods of effective learning and demonstrate application of learning in treatment.
5. Understand different cognitive processes, comprehend memory process, describe short term memory and differentiate with long term memory., list causes of forgetting, and illustrate methods of improving memory.
6. Comprehend concept of thinking and its application to health care.
7. Understand nature of intelligence, explain growth of intelligence, compare role of heredity and environment in intellectual development. Method of assessment of intelligence.
8. Define personality, list determinants of personality, understand different theories of personality and learn methods of personality assessment.

### COURSE CONTENTS

#### Behavioural Sciences –

1. Introduction: General introduction to Behavioural Psychology  
What is behavioural psychology, components, individual differences and applications of behavioural sciences in patient care and medical education.
2. Motivation  
Definition of motivation, theories, types –physiological and social motives, Maslow’s hierarchy of motives, clinical application
3. Emotion and its application to health  
Theories of emotions, type and impact on health.
4. Learning and conditioning.

Components of learning, classical conditioning, operant conditioning, cognitive, social, biological and observational learning. Methods of effective learning, behaviour and cognitive therapy.

5. Cognitive process and memory

Sensation, perception, illusion, memory process, short term and long term memory, causes of forgetting and methods to improve memory.

6. Thinking and problem solving

Definition of thinking, components of thinking-imagery recollection, language, steps in problem solving, abnormalities in thinking, decision making.

7. Intelligence: General concepts and techniques for assessment.

Theory of intelligence, growth of intelligence, stability of intelligence, determinants of intelligence, assessment of intelligence, extremes of intelligence.

8. Personality (Principles of Personality development) and objective testing of Personality

Definition of personality, trait, factors influencing personality development, theories of personality and personality assessment.

Method Teaching Lectures & Discussion Assessment – Nil

## **PSYCHIATRY**

### **OBJECTIVES**

At the end of the course, the student will be able to:

1. Introducing concept of psychiatric disorders and their classification
2. Awareness of general issues about etiology of psychiatric disorders and methodology used to study etiology of these disorders.
3. Ability to diagnose and treat common psychiatric disorders like schizophrenia, acute manic episode, depression, anxiety disorders including phobias and OCD, conversion and dissociative disorders.
4. To be able to diagnose severe/suicidal cases of depression and to refer them.
5. Understand the concept of personality disorders.
6. Ability to diagnosis and treat alcohol and drug dependence and withdrawal states.
7. Ability to diagnose common psychiatric disorders in children.
8. To know the role of counseling and psychological therapies in treatment of psychiatric disorders.
9. Demonstrate role of psychological testing in assessment of psychiatric disorders.

### **COURSE CONTENT**

1. Introduction and classification of Psychiatric disorders

Concept of psychiatric disorders; need for classification; types of classification e.g. atheoretical, symptom – based; introducing the Inter national Classification of Diseases ((ICD) and the Diagnostic and Statistical Manual (DSM); major categories of psychiatric disorders; diagnosis of organic disorders.

## 2. Aetiology of Psychiatric disorders

Overview of contribution of different scientific disciplines to psychiatric aetiology – clinical descriptive studies, epidemiology, social sciences e.g. role of life events, stress; genetics; biochemical studies; pharmacology; endocrinology; physiology; neuropathology; psychology.

## 3. Schizophrenia

Epidemiology, clinical features, subtypes, diagnosis, overview of aetiology, course, treatment – pharmacological, role of ECT.

## 4. Bipolar disorders

Epidemiology, clinical features, diagnosis, overview of aetiology, course, treatment – pharmacological.

## 5. Depression

Epidemiology, clinical features, diagnosis, overview of aetiology, co-morbidity with organic disorders, course, treatment – pharmacological.

## 6. Anxiety neurosis, phobia and OCD

Types of anxiety disorders; phobia, OCD, clinical features and epidemiology; diagnosis, differential diagnosis; overview of aetiology; course; treatment – pharmacological and non-pharmacological.

## 7. Hysterical neurosis (Conversion and Dissociative disorders)

Epidemiology, clinical picture, diagnosis, differential diagnosis, aetiology, prognosis, treatment.

## 8. Personality disorders

Concept of personality disorders, epidemiology, classification, assessment, overview of clinical features, aetiology, prognosis.

## 9. Drug and Alcohol dependence

Concept of abuse and dependence, epidemiology of alcohol and opiate dependence; clinical features, withdrawal symptoms including complicated withdrawal, psychosocial complications, aetiology, outcome, treatment.

## 10. Psychiatric disorders of childhood and adolescence,

Classification of childhood psychiatric disorders, epidemiology, clinical features, aetiology, assessment.

## 11. Counselling and psychological therapies

Counselling process, skills, different counseling approaches, behaviour therapy, cognitive therapy and its applications.

## 12. Psychological testing

What are psychological tests, standardization, reliability, validity, intelligence test, personality test, application.

# SURGERY

HIMS of the surgical education for undergraduates are to develop a primary care physician with appropriate knowledge, skill and attitude to treat common disease at the

primary care level. Emphasis will be laid on the primary care of the injured, care of comatose, common wounds and ulcers, resuscitation of patient with cardiac arrest, initial care of acute abdominal conditions and other emergencies. Diagnosis, workup and proper referral of common conditions viz. hernia, lumps in breast, thyroid, piles and fissure & fistula, abdominal lumps, renal stones, varicose veins will be covered substantially.

## **OBJECTIVES**

### **Knowledge**

At the end of the course, the student shall be able to:

1. Describe aetiology, pathophysiology, principles of diagnosis and management of common surgical problems including emergencies, in adults and children:
2. Define indications and methods for fluid and electrolyte replacement therapy including blood transfusion:
3. Define asepsis, disinfection and sterilization and recommend judicious use of antibiotics:
4. Describe clinical features and risk factors of common malignancies in the country and their management including prevention.
5. Enumerate different types of anaesthetic agents, their indications, mode of administration, contraindications and side effects.

### **Skills**

At the end of the course, the student should be able to:

1. Diagnose common surgical conditions both acute and chronic, in adult and children;
2. Plan various laboratory tests for surgical conditions and interpret the results;
3. Identify and manage patients of haemorrhagic, septicæmic and other types of shock;
4. Be able to maintain patent air-way and resuscitate a -
  - (i) a critically injured patient;
  - (ii) patient with cardio-respiratory failure;
  - (iii) a drowning case.
5. Monitor patients of head, chest, spinal and abdominal injuries, both in adults and children;
6. Provide primary care for a patient of burns;
7. Acquire principles of operative surgery, including pre-operative, operative and post operative care and monitoring;
8. Treat open wounds including preventive measures against tetanus and gas gangrene;
9. Diagnose neonatal and paediatric surgical emergencies and provide sound primary care before referring the patient to secondary / tertiary centers;
10. Identify congenital anomalies and refer them for appropriate management.

## COURSE CONTENT

A combination of system-based model and the spiral model is recommended for the MBBS course:

Pathogenesis, causes, epidemiology, Clinical Presentation, Investigations, and management of the diseases in the following systems:

1. **Skin:** ulcers and wounds, wound infections, burns, skin infections (boils, carbuncle, abscess), cysts (epidermoid cyst, dermoid), skin tumors (basal cell carcinoma, squamous cell carcinoma, melanoma).
2. **Head and Neck region:** congenital anomalies (cleft lip, cleft palate, branchial cyst and fistula, thyroglossal cyst) swellings of parotid and submandibular glands, oral ulcers, leukoplakia, submucous fibrosis, lichen planus, common jaw tumors, squamous carcinoma of oral cavity, pharynx & larynx. Thyroid swellings (adenomatous goitre, Graves' Disease, papillary and follicular thyroid cancer). Swellings of lymph nodes (tuberculosis, lymphoma, metastatic carcinoma)
3. **Arteries:** Features of limb Ischaemia, noninvasive vascular diagnostic tests, obliterative atheromatous disease, aneurysms, Raynaud's syndrome, arterial emboli.
4. **Veins:** varicose veins, deep vein thrombosis, pulmonary embolism.
5. **Breast:** mastalgia, and I, fibroadenoma, cyst, breast abscess, cancer of the breast.
6. **Oesophagus:** dysphagia, reflux, hiatus hernia, benign and malignant tumours.
7. **Stomach and duodenum:** Peptic ulcer- stomach and duodenum, carcinoma of the stomach, gastritis.
8. **Small intestine:** Small bowel obstruction, intestinal tuberculosis.
9. **Colon and rectum:** Amoebic colitis, Ulcerative colitis, colorectal cancer.
10. **Appendix:** Acute appendicitis.
11. **Anus:** Haemorrhoids, Pruritus ani, Fissure-in-ano, Anorectal abscesses, Fistula-in-ano, cancer of the anus.
12. **Peritoneum and intraperitoneal abscesses:** peritonitis.
13. **Liver:** Hepatic trauma, abscesses, cancer.
14. **Biliary tract:** gall stone disease, carcinoma of the gallbladder.
15. **Pancreas:** Acute pancreatitis, pancreatic cancer.
16. **Acute abdomen**
17. **Hernias of the abdominal wall:** Inguinal hernias, femoral hernia, umbilical and epigastric hernia.
18. **Urology:** Diagnostic studies and techniques in the urinary tract, trauma to the urinary tract, urinary calculi, urinary tract infection, prostatic hyperplasia, tumours of the kidney, epididymo-orchitis, hydrocele, tumours of the testicle, carcinoma of the penis.

## **Objectives of Clinical Training**

At the end of clinical posting in surgery, a student should be able to:

- Elicit a detailed & relevant history
- Carry out a physical examination
- Identify patients' problems
- Reach a differential diagnosis
- Formulate appropriate investigations
- Interpret the results of investigations
- Plan appropriate management
- Undertake some aspects of management
- Demonstrate adequate communication skills

## INTERNSHIP

The total duration of Internship at HIMS is one year on rotation basis. The details of Posting are as follows:

<b>Specialty</b>	-	<b>Duration</b>
Medicine(including Psychiatry)	-	2 months
Surgery (including Anaesthesia)	-	2 months
Communtiy Med.	-	2 months
Paediatrics	-	1 month
Obst. & Gynae. (including family planning)	-	2 month
Orthopaedics including PMR	-	1 month
Casualty	-	15 days
Ophthalmology	-	15 days
ENT	-	15 days
Elective	-	15 days
<b>Total</b>		<b>12 months</b>