



Sri Muthukumaran Medical College Hospital and Research Institute

Chikkarayapuram, Near Mangadu, Chennai – 600069.

PROGRAM: MBBS CBME REGULATIONS: 2019-2020

PROGRAM OUTCOMES (POs)

Upon completion of the MBBS program the medical graduate should be able to:

PO1: Demonstrate an in depth understanding of normal and abnormal human structure, functioning, and development from molecular, cellular, biological, clinical, behavioural, and social perspectives.

PO2: Demonstrate knowledge of various therapeutic modalities, prescribe, and safely administer appropriate treatments including nutritional interventions and pharmacotherapy based on principles of rational drug use, scientific evidence, and cost-effectiveness for disease prevention, treatment, pain relief, health promotion, rehabilitation, and palliation.

PO3: Demonstrate proficiency in clinical problem-solving, judgment, and data interpretation to address patient issues, formulate differential diagnoses, and create individualized management plans that include preventive, promotive, and therapeutic goals.

PO4: Apply clinical skills in diagnosing and managing common ailments in individuals and communities through effective history-taking, physical examinations, and relevant clinical investigations, while fulfilling responsibilities as an efficient member of a multi specialty healthcare team in diverse clinical settings.

PO5: Demonstrate advocacy for disease prevention, health promotion, and healthcare quality improvement by preventing and early intervention of the lifestyle diseases and cancer, in collaboration with other healthcare team members.

PO6: Demonstrate the ability to pursue basic, clinical, and translational research in recent medical advances relevant to patient care, along with a commitment to lifelong learning.

PO7: Communicate effectively, empathetically, and respectfully with patients in a language they understand, enhancing patient satisfaction, trust, and health outcomes.

PO8: Interpret the national and regional healthcare policies, frameworks, health economics, and systems that impact health promotion, healthcare delivery, disease prevention, and patient safety and apply them in real time practice.

PO9: Comprehend the medico-legal, societal, ethical, and humanitarian principles that influence healthcare and apply these principles in professional practice.

PO10: Be competent to function effectively and responsibly as a member and leader of an inter-professional healthcare team, respecting the diversity of roles, responsibilities, and competencies of other health professionals.

PO11: Exhibit professionalism through personal integrity, responsibility, dependability, and ethical conduct in professional settings.

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PO12: Demonstrate an attitude for continued self-learning and seek further expertise or pursue research in any chosen area of medicine.

COURSE OUTCOMES (COs)

HUMAN ANATOMY

At the end of the Anatomy course the first year MBBS student should be able to

Knowledge:

CO1: Comprehend the normal disposition, clinically relevant interrelationships, functional and cross-sectional Anatomy of the various organs and structures of the body.

CO2: Identify the gross and microscopic structure and correlate elementary ultra structure of various organs and tissues with the functions as a prerequisite for understanding the altered state in various disease processes.

CO3: Comprehend the basic structure and connections of the central nervous system to analyze the integrative and regulative functions of the organs and systems and locate the site of gross lesions according to the deficits encountered.

CO4: Demonstrate knowledge of the basic principles and sequential development of the organs and systems; recognize the critical stages of development and the effects of common teratogens, genetic mutations and environmental hazards and explain the developmental basis of the major variations and abnormalities.

CO5: Explain the clinical basis of some common clinical procedures i.e. intramuscular and intravenous injection, lumbar puncture and kidney biopsy etc.

CO6: Describe the principles of karyotyping and identify the gross congenital anomalies.

CO7: Comprehend the principles of newer imaging techniques and interpretation of CT scan, sonogram, MRI & Angiography.

Skills:

CO8: Identify and locate all the structures of the body and mark the topography of the Living Anatomy.

CO9: Identify the organs and tissues under the microscope.

CO10: Recognize the cadaver as the first teacher and assist in human cadaver dissection.

PHYSIOLOGY

Upon completion of the Physiology course, the first year MBBS students must be able to:

Knowledge

CO1: Describe the normal functions of all the systems, the regulatory mechanisms and interactions of the various systems for well-coordinated total body functions.

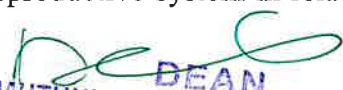
CO2: Describe the relative contribution of each organ system in the maintenance of the milieu interior (homeostasis)

CO3: Explain the physiological aspects of the normal growth and development and the age-related physiological changes in the organ functions.

CO4: Comprehend the physiological principles underlying pathogenesis and treatment of diseases.

CO5: Correlate knowledge of physiology of human reproductive system in relation to National Family welfare program.

Skills:


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CO6: Analyze the physiological responses and adaptation to environmental stress.

CO7: Conduct experiments designed for study of physiological functioning of the hematological, musculoskeletal, alimentary, endocrine, reproductive, renal, cardiovascular, respiratory, and neurological systems.

CO8: Interpret experimental/investigative data and distinguish between normal and abnormal data derived as a result of clinical examination and tests including serum electrolytes, pH, osmolarity, blood gases, pulmonary function, renal function and cardiac function tests.

CO9: Recognize and get familiar with newer computerized and advanced instruments like Spirometer, semen quality analyzer, EMG, ECG and TMT.

BIOCHEMISTRY

Upon completion of the Biochemistry course, the first year MBBS students must be able to:

Knowledge:

CO1: Enlist and describe the cell organelles with their molecular and functional organization.

CO2: Delineate structure, function and interrelationships of various biomolecules and consequences of deviation from the normal.

CO3: Explain the basic enzymology and emphasize on its clinical applications wherein regulation of enzymatic activity is disturbed.

CO4: Describe digestion and assimilation of nutrients and consequences of malnutrition.

CO5: Describe and integrate metabolic pathways of various biomolecules with their regulatory mechanisms.

CO6: Explain the biochemical basis of inherited disorders with their associated sequel.

CO7: Describe mechanisms involved in maintenance in water, electrolyte and acid base balance and consequences of their imbalances.

CO8: Outline the molecular mechanisms of gene expression and regulation, basic principles of biotechnology and their applications in medicine.

Skills:

CO9: Perform biochemical analysis relevant to clinical screening and diagnosis using conventional techniques / instruments

CO10: Analyse and interpret investigative data and apply it in solving scientific and clinical problems and decision making.

PHARMACOLOGY

At the end of the Pharmacology course, the Second year MBBS must be able to:

Knowledge:

CO1: Describe the Pharmacokinetics and Pharmacodynamics of essential and commonly used drugs.

CO2: Enlist the indications, contraindications, interactions and adverse reactions of commonly used drugs.

CO3: Select and prescribe medications based on clinical conditions, considering pharmacological properties, efficacy, safety, suitability, and cost for common clinical conditions in for individual needs and Mass therapy, under National Health Programs.

CO4: Integrate the list of drugs of addiction and recommend the management of drug addiction.

CO5: Explain pharmacological basis of prescribing drugs in special medical situations such as pregnancy, lactation, infancy, old age, renal damage, hepatic damage and immunocompromised patients.



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CO6: Explain the concept of rational drug therapy in clinical pharmacology and the principles underlying the concept of 'Essential Drugs'

CO7: Evaluate the ethics and modalities involved in the development and introduction of new drugs.

Skills:

CO8: Prescribe drugs for common ailments and identify adverse reactions and drug interactions of commonly used drugs.

CO9: Interpret the data obtained from the experiments designed for the study of effect of drugs in various experimental and clinical studies.

CO10: Analyze the information regarding common pharmaceutical preparations and critically evaluate drug formulations, appraise the Principles of Clinical Pharmacy and Dispense the Medications giving proper instructions.

PATHOLOGY

At the end of the Pathology course, the Second year MBBS must be able to:

Knowledge:

CO1: Describe the structure and ultra structure of a sick cell, causes and mechanisms of cell Injury, cell death and repair, and correlate structural and functional alterations in the sick cell.

CO2: Explain the physiological processes of maintenance of homeostasis, mechanisms of their disturbance and its morphological and clinical manifestations.

CO3: Describe the mechanisms and patterns of tissue response to injury so as to understand the pathophysiology of disease processes and their application to clinical science.

CO4: Correlate the gross and microscopic alterations of different organ systems in common disease to the extent needed for understanding disease processes and their clinical significance.

CO5: Comprehend the steps in neoplastic changes in the body and their effects in order to appreciate need for early diagnosis and management of neoplasia.

CO6: Explain the mechanisms of common disease of the organ systems and the hematological disorders and develop a logical approach in their diagnosis and management.

CO7: Comprehend the process of blood banking, blood donors & transfusion of blood & blood products, (components).

CO8: Explain the pathophysiology of infectious diseases in relation with tissue changes and genetic disorders,

CO9: Describe the various immunological reactions in understanding the disease process & tissue transplant

Skills:

CO10: Draw a rational scheme of investigations aimed at diagnosing and managing the cases of common disorders.

CO11: Perform and interpret the routine technical procedures of the diagnostic laboratory tests and correlate with clinical, hematological and morphological changes.

CO12: Perform the simple bed-side tests on blood, urine and other biological fluid samples:

MICROBIOLOGY

Upon completion of the Microbiology course, the second year MBBS students must be able to:

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Knowledge:

CO1: Describe the characteristics (morphology, cultural characteristics, resistance, virulence factors, incubation period, mode of transmission etc.) of different microorganisms.

CO2: List the commercial, opportunistic and pathogenic organisms and explain host parasite relationship and how the different microorganisms can cause human infection.

CO3: Explain the various Défense mechanisms of the host against the microorganisms which can cause human infection and the prophylaxis for the particular infecting microorganisms

CO4: Describe the laboratory diagnosis of microorganisms causing human infections and disease.

Skills:

CO5: Plan and perform the laboratory investigations for the diagnosis of infectious diseases to arrive at the etiological diagnosis of infectious diseases caused by bacteria, fungi, viruses and parasites including the drug sensitivity profile.

CO6: Perform and interpret immunological and serological tests.

CO7: Operate routine and sophisticated instruments in the laboratory, and successfully implement the chosen research methodology

FORENSIC MEDICINE AND TOXICOLOGY

Upon completion of the Forensic Medicine and Toxicology course, the third year MBBS students must be able to:

Knowledge:

CO1: Identify the basic Medico-legal aspects of hospital and general practice and define the Medico-legal responsibilities of a general Physician while rendering community service either in a rural or an urban health centre.

CO2: Appreciate the Physician's responsibilities in criminal matters and respect for the codes of medical ethics.

CO3: Describe the general principles of analytical toxicology, diagnose, manage and identify legal aspect of common acute and chronic poisonings.

CO4: Describe the Medico-legal aspects and findings of post-mortem examination in cases of death due to common unnatural conditions and poisonings.

CO5: Detect occupational and environmental poisoning, prevention and epidemiology of common poisoning and their legal aspects particularly pertaining to Workmen's Compensation Act.

Skills:

CO6: Make observations and draw logical inferences in order to initiate enquiries in criminal matters and Medico-legal problems

CO7: Perform proper Medico-legal examination and documentation/reporting of Injury and Age.

CO8: Conduct examination for sexual offences and intoxication and preserve relevant ancillary materials for medico-legal examination.

CO9: Identify important post-mortem findings in common unnatural deaths, perform and interpret findings at post-mortem examination.

CO10: Diagnose and treat common emergencies in poisoning and chronic toxicity.

CO11: Observe the principles of medical ethics in the practice of his/her profession.

OPHTHALMOLOGY

Upon completion of the Ophthalmology course, the third year MBBS students must be able to:

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Knowledge:

CO1: Explain the principles of management of major ophthalmic emergencies and main systemic disease afflicting the eye.

CO2: Describe the effects of local and systemic diseases on patient's vision and the necessary action required minimizing the sequelae of such diseases.

CO3: Explain the Adverse drug reaction of drugs with special reference to ophthalmic manifestations.

CO4: Describe the magnitude of blindness in India and its main causes, the national programme for control of blindness, its implementation at various levels in integration with other national health programmes

CO5: Provide eye care education for prevention of eye problems and organize eye camps as a primary health care provider in the primary health centre.

Skills:

CO6: Elicit a history pertinent to general health and ocular status and provide first aid in major ophthalmic emergencies.

CO7: Assist in diagnostic procedures such as visual acuity testing, examination of eye. Schiotz tonometry, Staining of Corneal pathology, confrontation, perimetry, Subjective refraction including correction of Presbyopia and aphakia. Direct ophthalmoscopy and conjunctival smear examination and Cover test.

CO8: Diagnose and treat common problems affecting the eye, and interpret ophthalmic signs in relation to common systemic disorders.

CO9: Assist/observe therapeutic procedures such as Subconjunctival injection. Corneal conjunctival foreign body removal, carbolic cautery for corneal ulcers, Nasolacrimal duct syringing and tarsorrhaphy

CO10: Use effective means of communication with the public and individual to motivate for surgery in cataract and for eye donation and organize eye banks

CO11: Establish rapport with his seniors. colleagues and paramedical workers. so as to effectively function as a member of the eye care team.

OTORHINOLARYNGOLOGY

Upon completion of the Otorhinolaryngology course, the third year MBBS students must be able to:

Knowledge:

CO1: Describe the anatomy of the external, middle, and inner ear, as well as the nose and throat (ENT).

CO2: Describe the basic pathophysiology of common Ear, Nose & Throat (ENT) diseases & emergencies.

CO3: Prescribe commonly used drugs for ENT conditions rationally, considering their adverse reactions.

CO4: Identify hearing impairment and refer patients to appropriate hearing impairment rehabilitation programs.

CO5: Prescribe relevant investigative procedures for common ENT conditions and interpret the results.

Skills:


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CO6: Examine & diagnose common ENT problems including pre-malignant & Malignant disorders of the Head & Neck.

CO7: Manage ENT problems at first level of care & be able to refer whenever necessary.

CO8: Assist / carry out minor ENT procedures like ear syringing, ear dressing, nasal packing.

CO9: Assist in certain procedures such as tracheotomy, endoscopy & removal of foreign bodies.

COMMUNITY MEDICINE

Upon completion of the Community Medicine course, the third year MBBS students must be able to:

Knowledge:

CO1: Explain the principles of sociology including demographic population dynamics, identify social factors related to health, disease and disability in the context of urban and rural societies.

CO2: Outline the demographic pattern of the country and appreciate the roles of the individuals, family, community and socio-cultural milieu in health and disease.

CO3: Describe the elements of normal psychology and social psychology, the impact of urbanization on health and disease, observe and interpret the dynamic of community behaviors.

CO4: Describe and apply the principles of practice of medicine in hospital and community settings, health care delivery systems including rehabilitation of the disabled in the country.

CO5: Describe the National Health Programmes with particular emphasis on maternal and child health programmes, family welfare planning and population control.

CO6: Describe the epidemiological methods and techniques.

CO7: Describe the health information systems, acquire, understand, integrate, apply and manage information in context to health care problems and health care delivery system in various communities, health care settings and hospitals.

CO8: Describe the principles and components of primary health care, National Rural Health Mission and the national health policies to achieve the goal of "Health for all".

CO9: Describe and identify the environmental, bio-waste and occupational hazards and their control, the importance of water and sanitation in human health.

CO10: Describe and apply the principles of health economics, health administration, health education in relation to community.

Skills:

CO11: Communicate with patients including history taking and medico social work, use epidemiology as a scientific tool to make rational decisions relevant to community and individual patient intervention and for community-based research

CO12: Organize health care services for vulnerable and disadvantages groups and in case of calamities.

CO13: Diagnose and manage common health problems (including communicable and non-communicable diseases), nutritional problems and emergencies at the individual, family and community levels keeping in mind the existing health care resources and in the context of the prevailing socio-culture beliefs.

CO14: Interact with other members of the health care team and participate in the organization of health care services, health advocacy and implementation of national health programmes.

CO15: Observe the principles of medical ethics in professional practice and in perform administrative functions at health centers.



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GENERAL MEDICINE

Upon completion of the General Medicine course, the final year MBBS students must demonstrate ability to do the following:

Knowledge:

CO1: Explain the underlying pathophysiology, epidemiological characteristics, clinical manifestations, diagnostic protocols, and therapeutic approaches for various diseases.

CO2: Describe the common clinical disorders with special reference to infectious diseases. nutritional disorders. geriatric disorders, tropical and environmental diseases.

CO3: Outline various modes of management including drug therapeutics especially dosage, side effects, toxicity, interactions, indications and contra-indications

CO4: Propose diagnostic and investigative procedures and ability to interpret them;

CO5: Provide first level management of acute emergencies promptly and efficiently and decide the timing and level of referral, if required.

CO6: Stay updated with the latest advancements in the field of medicine.

Skills:

CO7: Apply clinical skills (history taking, clinical examination and other instruments of examination) to diagnose various common medical disorders and emergencies.

CO8: Refer a patient to secondary and/or tertiary level of health care after having instituted primary care

CO9: Perform simple routine investigations like hemogram, stool, urine, sputum and biological fluid examinations:

CO10: Assist the common bedside investigative procedure like pleural tap, lumbar puncture, bone marrow aspiration/biopsy and liver biopsy.

GENERAL SURGERY

Upon completion of the General surgery course, the final year MBBS student must be able to:

Knowledge:

CO1: Describe aetiology, pathophysiology, principles of diagnosis and management of common surgical problems including emergencies in adult and children.

CO2: Define indications and methods for fluid and electrolytes replacement therapy including blood transfusion.

CO3: Define asepsis, disinfection and sterilization and recommend judicious use of antibiotics.

CO4: Describe common malignancies in the country and their management including prevention.

CO5: Enumerate different types of anaesthetic agents, their indications, contraindications, mode of administration and side effects.

Skills:

CO6: Diagnose common surgical conditions both acute and chronic in adults and children.

CO7: Plan various laboratory tests for surgical conditions and interpret the results.

CO8: Identify and manage patients of haemorrhagic, septicæmia and other types of shock.

CO9: Be able to maintain patent air-way and resuscitate, monitor patient of head, chest, spinal and abdominal injuries, both in adults and children.

CO10: Apply principles of operative surgery including preoperative, operative and post operative care and monitoring.



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CO11: Provide primary care for a patient of burns and treat open wound including preventive measures against tetanus and gas gangrene.

CO12: Diagnose neonatal and paediatric surgical emergencies and provide sound primary care before referring the patient to secondary/tertiary centres, identify congenital anomalies and refer them for appropriate management.

PAEDIATRICS

Upon completion of the Paediatrics course, the final MBBS student must demonstrate ability to:

Knowledge:

CO1: Describe the normal growth and development during foetal life, neonatal period, childhood and adolescence and the deviations thereof.

CO2: Describe the common paediatric disorders and emergencies in terms of epidemiology, etiopathogenesis, clinical manifestations, diagnosis and also describe the rational therapy and rehabilitation services.

CO3: Describe age related requirements of calories, nutrients, fluids dosages of drugs etc. in health and disease.

CO4: Describe preventive strategies for common infectious disorders, malnutrition, genetic and metabolic disorders, poisonings, accidents and child abuse.

CO5: Outline national programs related to child health including Immunization programs

Skills:

CO6: Obtain detailed Paediatric and Neonatal history and conduct an appropriate physical examination of children and neonates. make clinical diagnosis, conduct common bedside investigative procedures, interpret common laboratory investigations, plan and institute therapy.

CO7: Perform anthropometric measurements. resuscitate newborn, prepare oral rehydration solution, perform tuberculin test, administer vaccines available under current National programs. perform venesection, start intravenous fluids and provide nasogastric feeding.

CO8: Conduct diagnostic procedures such as lumbar puncture, liver and kidney biopsy, bone marrow aspiration, pleural and ascitic tap.

CO9: Distinguish between normal Newborn babies and those requiring special care and institute early care to all newborn babies including care of preterm and low birth weight babies. provide correct guidance and counselling about breastfeeding and complementary feeding.

CO10: Provide ambulatory care to all not so sick children. identify indications for specialized/inpatient care and ensure timely referral to those who require hospitalization.

OBSTETRICS AND GYNAECOLOGY

Upon completion of the Obstetrics and gynaecology course, the final MBBS students must demonstrate ability to:

Knowledge:

CO1: Outline the anatomy, physiology and pathophysiology of the reproductive system and the common conditions affecting it.

CO2: Diagnose normal pregnancy, labour, puerperium and manage the problems he is likely to encounter therein.



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CO3: List of leading causes of maternal and perinatal morbidity and mortality.

CO4: Explain the principles of contraception and various techniques employed, methods of medical termination of pregnancy, sterilization and their complications.

CO5: Identify the use, abuse and side effects of drugs in pregnancy, peri- menopausal and post-menopausal periods.

CO6: Describe the national programme of maternal and child health and family welfare and their implementation at various levels.

CO7: Identify common gynaecological diseases and management. describe principles of their management.

CO8: State the indications, techniques and complications of surgeries like Caesarian section, laparotomy, abdominal and vaginal hysterectomy, vacuum Aspiration for Medical Termination of pregnancy (MTP) and minor surgeries like EB, D and C, Cervical Biopsy and Cervical encircilage.

Skills:

CO9: Obtain proper history and writing a good case sheet and write a good discharge summary, proper referral letter.

CO10: Examine the patient and arrival at a diagnosis, plan for investigation and treatment

CO11: Interpret data of investigations like biochemical, histopathological, radiological ultrasound etc.

CO12: Examine a pregnant woman, recognize high- risk pregnancies and make appropriate referrals.

CO13: Conduct a normal delivery, plot and interpret a partogram, recognize complications and decision of referral, provide postnatal care, resuscitate the newborn and recognize the congenital anomalies.

CO14: Advise a couple on the use of various available contraceptive devices.

CO15: Perform pelvic examination, diagnose and manage common gynaecological problems including early detection of genital malignancies.

CO16: Obtain a vaginal cytological smear, perform a post coital test and wet vaginal smear examination for Trichomonas vaginalis, Moniliasis and gram stain for gonorrhoea, catheterization of urinary bladder.

ANAESTHESIOLOGY

Upon completion of the Anaesthesiology course the final MBBS students shall be able to:

Knowledge:

CO1: Explain simple nerve block and pain relief

CO2: Explain the principles of administration of general, regional and local anaesthesia.

CO3: Explain the importance of hypoglycemia and hyperglycemia, hypotension and hypertension, IHD, Myocardial infarction and the role of ventilators.

Skills:

CO4: Perform cardio-pulmonary resuscitation with the available resources and transfer the patients to a bigger hospital for advanced life support.

CO5: Set up intravenous infusion and manage fluid therapy

CO6: Clear and maintain airway in unconscious patient and administer oxygen correctly

CO7: Manage Head Trauma, and its anaesthetic management and various protocols regarding their management and associated trauma, intracranial surgery and spinal surgery, both routine and emergency.

CO8: Monitor techniques for detection and management of air embolism



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CO9: Perform lumbar puncture and CSF drainage.

CO10: Perform non-surgical management of the head trauma patient and systemic complications of severe brain injury.

CO11: Manage subarachnoid haemorrhage and vasospasm.

CO12: Diagnose and manage patients with brainstem death and deal with patients' relatives.

DERMATOLOGY

At the end of the course of Dermatology the final MBBS student shall be able to:

Knowledge:

CO1: Demonstrate sound knowledge of common diseases, their clinical manifestations including emergent situations and of investigative procedures to confirm their diagnosis.

CO2: Demonstrate comprehensive knowledge of various modes of therapy used in treatment of cutaneous, sexually transmitted diseases and leprosy.

CO3: Describe the mode of action of commonly used drugs, their doses, side effects/toxicity, indications and contra-indications and interactions.

CO4: Describe commonly used modes of management including the medical and surgical procedures available for the treatment of various diseases and to offer a comprehensive plan of management for a given disorder.

Skills:

CO5: Interview the patient, elicit relevant and correct information and describe the history in a chronological order.

CO6: Conduct clinical examination, elicit and interpret physical findings and diagnose common disorders and emergencies.

CO7: Demonstrate simple, routine investigative and laboratory procedures required for making the bed-side diagnosis, especially the examination of scrapings for fungus, preparation of slit smears and staining for AFB for leprosy patients and for STD cases and take a skin biopsy for diagnostic purposes.

CO8: Manage common diseases and recognizing the need for referral for specialized care, in case of inappropriateness of therapeutic response.

ORTHOPAEDICS

At the end of the Orthopaedics course, the final MBBS student shall be able to

Knowledge:

CO1: Explain the principles, diagnosis and primary management and be able to give appropriate referral for further definitive management of bones and joint injuries.

CO2: Describe Osteogenesis, manifestation and diagnosis, primary management and give their referral for appropriate correction or rehabilitation of common musculoskeletal disorders including infections of bones and joints, congenital skeletal anomalies, metabolic bone diseases and neoplasm affecting bones.

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CO3: Explain indications for closed reductions. open reductions. internal fixation and external fixations of fracture.

Skills:

CO4: Detect soft tissue injuries such as sprains and strains.

CO5: Detect common fractures of extremities.

CO6: Deliver first aid measures for common fractures and sprains

CO7: Deliver emergency measures to poly trauma patients.

CO8: Manage uncomplicated fractures of clavicle, forearm, phalanges etc.

CO9: Use techniques of splinting such as application of Thomas splint, plaster slab and casts, immobilization by skin tractions etc.

CO10: Manage common bone infections and comprehend the indications for sequestration, amputation and corrective measures for bone deformities.

CO11: Advice and counsel patient for rehabilitation for post traumatic, poliomyelitis, cerebral palsy and amputation.

CO12: Perform certain orthopaedic skills. provide sound advice of skeletal and related conditions at primary or secondary health care level.

PSYCHIATRY

At the end of the Psychiatry course the final year MBBS student shall be able to

Knowledge:

CO1: Explain the comprehensive nature & development of different aspects of normal human behaviour like learning. memory. motivation, personality & intelligence.

CO2: Recognize differences between normal & abnormal behaviour.

CO3: Classify psychiatric disorders.

CO4: Recognize clinical manifestations of the following common syndromes & plan their appropriate management of organic psychosis, functional psychosis, schizophrenia, affective disorders, neurotic disorders, personality disorders, psycho physiological disorders, drug & alcohol dependence. psychiatric disorders of childhood & adolescence.

CO5: Describe rational use of different mode of therapy in psychiatric disorders.

CO6: Define, elicit & interpret psychopathological symptoms & signs.

Skills:

CO7: Interview the patient & understand different methods of communication in patient-doctor relationship.

CO8: Elicit detailed psychiatric case history & conduct clinical examination for assessment of mental status.

CO9: Diagnose & manage common psychiatric disorders.

CO10: Identify & manage common psychological reactions & psychiatric disorders in medical & surgical patients in clinical practice & in community setting.

RADIOLOGY

At the end of the course, the final MBBS student shall be able to

Knowledge:

CO1: Enlist and describe the various diagnostic modalities.

CO2: Delineate normal and abnormal radiological findings.

CO3: Comprehend basic radiology and emphasize on its clinical applications.


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CO4: Describe radiographic, ultra sonographic, CT, MRI features of common pathologies.

CO5: Describe and integrate radiological findings in CNS, GIT, RS, CVS, MSK, GUT.

Skills:

CO6: Make use of Imaging findings to reach to a diagnosis;

CO7: Analysis and interpret radiological data;

CO8: Demonstrate the skills of solving clinical problems by illustrative evidences and decision making.

RESPIRATORY MEDICINE

At the end of the course of Pulmonary Medicine, the final MBBS student shall be able to:

Knowledge:

CO1: Demonstrate sound knowledge of common chest diseases, their manifestations. including emergency situations and of investigative procedures to confirm their diagnosis.

CO2: Demonstrate comprehensive knowledge of various modes of therapy used in treatment of respiratory diseases.

CO3: Describe the modes of action of commonly used drugs, their doses, side effects/ toxicity indications and contra indications and interactions.

CO4: Describe commonly used modes of management including medical and surgical procedures available for treatment of various diseases and to offer a comprehensive plan of management inclusive of Revised National Tuberculosis Control programme.

Skills:

CO5: Interview the patient, elicit relevant and correct information and describe the history in chronological order:

CO6: Conduct clinical examination, elicit and interpret clinical findings and diagnose common respiratory disorders and emergencies;

CO7: Perform simple, routine investigative and office procedures required for making the bed side diagnosis especially sputum collection and examination for etiologic organisms especially Acid-fast Bacilli (AFB). interpretation of the chest x-rays and respiratory function tests:

Interpret and manage various blood gases and PH abnormalities in various respiratory diseases;

CO8: Manage common diseases recognizing need for referral for specialized care, in case of inappropriateness of therapeutic responses;

CO9: Assist in the performance of common procedures. like laryngoscopic examination, pleural aspiration, respiratory physiotherapy, laryngeal intubation and pneumothoracic drainage /aspiration.


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PROGRAM: MBBS REGULATIONS: 2018-2019

PROGRAM OUTCOMES (POs)

Upon completion of the MBBS program the graduate should be able to

PO1: Demonstrate an in depth understanding of normal and abnormal human structure, functioning, and development from molecular, cellular, biological, clinical, behavioral, and social perspectives.

PO2: Demonstrate knowledge of various therapeutic modalities, prescribe, and safely administer appropriate treatments including nutritional interventions and pharmacotherapy based on principles of rational drug use, scientific evidence, and cost-effectiveness for disease prevention, treatment, pain relief, health promotion, rehabilitation, and palliation.

PO3: Demonstrate proficiency in clinical problem-solving, judgment, and data interpretation to address patient issues, formulate differential diagnoses, and create individualized management plans that include preventive, promotive, and therapeutic goals.

PO4: Apply clinical skills in diagnosing and managing common ailments in individuals and communities through effective history-taking, physical examinations, and relevant clinical investigations, while fulfilling responsibilities as an efficient member of a multi specialty healthcare team in diverse clinical settings.

PO5: Demonstrate advocacy for disease prevention, health promotion, and healthcare quality improvement by preventing and early intervention of the lifestyle diseases and cancer, in collaboration with other healthcare team members.

PO6: Demonstrate the ability to pursue basic, clinical, and translational research in recent medical advances relevant to patient care, along with a commitment to lifelong learning.

PO7: Communicate effectively, empathetically, and respectfully with patients in a language they understand, enhancing patient satisfaction, trust, and health outcomes.


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PO8: Interpret the national and regional healthcare policies, frameworks, health economics, and systems that impact health promotion, healthcare delivery, disease prevention, and patient safety and apply them in real time practice.

PO9: Comprehend the medico-legal, societal, ethical, and humanitarian principles that influence healthcare and apply these principles in professional practice.

PO10: Be competent to function effectively and responsibly as a member and leader of an inter-professional healthcare team, respecting the diversity of roles, responsibilities, and competencies of other health professionals.

PO11: Exhibit professionalism through personal integrity, responsibility, dependability, and ethical conduct in professional settings.

PO12: Demonstrate an attitude for continued self-learning and seek further expertise or pursue research in any chosen area of medicine.

COURSE OUTCOMES (COs)

HUMAN ANATOMY

Upon completion of the course, the first year MBBS students must be able to:

CO1: Explain the development and gross and microscopic structure of the human body, understanding the normal regulation and integration of organ and system functions based on structural and genetic patterns.

CO2: Describe the identifying features of microscopic structures and correlate the elementary ultrastructure of various organs and tissues.

CO3: Identify and locate all body structures, map the topography of living anatomy, and recognize organs and tissues under a microscope.

CO4: Describe the clinical correlations of organs and structures, interpreting the anatomical basis of disease presentations as a foundation for understanding disease processes.

CO5: Describe the clinical applications of common procedures such as intramuscular and intravenous injections, lumbar punctures, and kidney biopsies.

CO6: Explain the principles of imaging techniques like ultrasound, computerized tomography, and plain and contrast X-rays, and their applications in diagnosing disease states.

CO7: Recognize the cadaver as the first teacher and assist in human cadaver dissection.

PHYSIOLOGY


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Upon completion of the course, the first year MBBS students must be able to:

CO1: Describe the normal functioning of body organs and organ systems, their interactions, physiological responses for maintaining homeostasis, and adaptations to internal and external environmental changes.

CO2: Describe the physiological functions of the organ systems of the body and articulate them with the pathogenesis of diseases.

CO3: Explain the age-related physiological changes in organ functions and how they reflect normal growth and development.

CO4: Diagnose conditions based on clinical symptoms and signs, and interpret laboratory test results including serum electrolytes, pH, osmolarity, blood gases, pulmonary function tests, renal function tests, and cardiac function tests.

CO5: Interpret investigative data in case scenarios related to common disorders of the hematological, musculoskeletal, alimentary, endocrine, reproductive, renal, cardiovascular, respiratory, and neurological systems.

CO6: Perform tests and calculate hematological indices, assess ventilatory function using spirometers and peak flow meters, measure blood pressure, record ECGs, and conduct clinical examinations of organ systems.

CO7: Correlate disease manifestations with physiological mechanism derangements and infer the rationale for treatment.

BIOCHEMISTRY

Upon completion of the course, the first year MBBS students must be able to:

CO1: Describe the molecular and functional organization of cells and their components.

CO2: Explain the biochemical and molecular processes involved in health and disease, including mechanisms for maintaining body fluid and pH homeostasis.

CO3: Describe the regulatory pathways of macromolecule metabolism and their clinical significance.

CO4: Explain the role of nutrition in health and disease, including the digestion and assimilation of macronutrients.

CO5: Explain the biochemical basis of environmental health hazards, inherited diseases, metabolic disorders, and carcinogenesis.

CO6: Describe fundamental aspects of enzymology and the clinical implications of altered enzyme regulation.

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CO7: Explain the biochemical basis and rationale of clinical laboratory tests, and demonstrate the ability to interpret these in a clinical context.

PHARMACOLOGY

At the end of the course, the Second year MBBS must be able to:

CO1: Outline the essential and commonly used drugs and explain the pharmacological basis of their therapeutic effects.

CO2: Classify drugs according to their pharmacological and organ system-based functions.

CO3: Explain the mechanism of action, pharmacodynamics and pharmacokinetics of the drugs, including their kinetics, antidotes, and drugs used in cases of common poisoning.

CO4: Select and prescribe medications based on clinical conditions, considering pharmacological properties, efficacy, safety, suitability, and cost for common clinical conditions of national importance.

CO5: Select and prescribe drugs in special situations such as pregnancy, lactation, and for geriatric and pediatric populations, as well as for mass therapy under national health programs.

CO6: Explain the importance of pharmacovigilance, the concept of essential medicines, and the sources of drug information.

CO7: Describe the ethics and methodologies involved in new drug development, including clinical practice, animal ethics, evidence-based medicine, and practice-oriented research.

CO8: Provide counselling and educate the patients on the appropriate use of prescribed drugs and drug delivery systems.

PATHOLOGY

At the end of the course, the Second year MBBS must be able to:

CO1: Describe the mechanisms of homeostasis, cell injury, cell degeneration, cell death, and repair.

CO2: Explain the mechanisms and patterns of inflammatory responses to tissue injury and their role in the pathophysiology of diseases.

CO3: Describe the causes, evolution, and mechanisms of diseases, including alterations in the gross and cellular morphology of organs in disease states.

CO4: Correlate the natural history, structural and functional changes of diseases with their clinical manifestations, diagnosis, and therapy.

CO5: Correlate normal and altered morphology (gross and microscopic) of different organ systems in common disease states.

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CO6: Perform simple biochemical tests on blood, urine, and other biological fluid samples, and interpret the results.

MICROBIOLOGY

Upon completion of the course, the second year MBBS students must be able to:

CO1: List pathogenic microorganisms (bacteria, viruses, parasites, fungi) and describe their roles in health and disease.

CO2: Explain the immunological mechanisms involved in health and disease.

CO3: Describe the morphology, classification, and virulence mechanisms of bacteria, viruses, fungi and other pathogenic micro organisms.

CO4: Correlate the natural history, mechanisms, and clinical manifestations of infectious diseases with the properties of microbial agents.

CO5: Demonstrate the basis for selecting laboratory diagnostic tests, interpreting their results, and choosing appropriate antimicrobial therapies, as well as methods for controlling and preventing infectious diseases.

CO6: Identify the infectious pathogens from clinical materials using suitable laboratory methods and interpret the findings.

FORENSIC MEDICINE AND TOXICOLOGY

Upon completion of the course, the second MBBS students must be able to:

CO1: Relate the existing laws and legal procedures relevant to a Registered Medical Practitioner in cases of homicide, assault, sexual offenses, alcoholic intoxication, drug dependence, and other situations requiring medical opinion.

CO2: Explain the medico-legal responsibilities of physicians in primary, secondary, and tertiary care settings.

CO3: Describe a rational approach to crime investigation based on scientific and legal principles.

CO4: Diagnose and manage medical and legal issues in cases of poisoning or overdose.

CO5: Describe codes of conduct and medical ethics, demonstrating an understanding of the medico-legal framework of medical practice and medical negligence.

CO6: Perform appropriate medicolegal examinations, documentation, and report preparation in all medicolegal cases.


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CO7: Collect, preserve, and dispatch specimens and relevant evidence materials to the appropriate centers in medicolegal cases.

CO8: Perform medicolegal autopsies under supervision and issue all relevant medical and medicolegal certificates.

OPHTHALMOLOGY

Upon completion of the course, the third year MBBS students must be able to:

CO1: Delineate the prevalent eye diseases in the community and describe the ophthalmic manifestations of systemic diseases.

CO2: Recognize, diagnose, and treat common eye problems, and identify when to refer patients.

CO3: Identify visual impairment and blindness in the community and actively participate in implementing National Programs for the Prevention and Control of Blindness.

CO4: Demonstrate skills in applying the procedures, indications, and contraindications of ocular bandaging techniques, methods for ocular surface staining, their applications, and procedures for dry eye evaluation.

CO5: Illustrate the assessment of all components of visual acuity, including distant vision, near vision, colour vision, and field of vision in cataract patients, and explain the precautions and procedures for epilation and foreign body removal using cotton swabs under topical anesthesia.

CO6: Demonstrate an understanding of the importance of eye donation from a community health perspective.

CO7: Communicate effectively to counsel and educate patients about cataract surgery.

OTORHINOLARYNGOLOGY

Upon completion of the course, the third year MBBS students must be able to:

CO1: Describe the anatomy of the external, middle, and inner ear, as well as the nose and throat (ENT).

CO2: Identify common otorhinolaryngological (ENT) emergencies and diseases.

CO3: Identify, diagnose, and manage common ENT problems in a patient care setting.

CO4: Recognize emergency ENT conditions requiring urgent or early surgical intervention and refer patients to appropriate centers at the optimal time.

CO5: Perform simple ENT procedures applicable in a patient care setting.

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CO6: Identify hearing impairment and refer patients to appropriate hearing impairment rehabilitation programs.

CO7: Prescribe relevant investigative procedures for common ENT conditions and interpret the results.

CO8: Prescribe commonly used drugs for ENT conditions rationally, considering their adverse reactions.

COMMUNITY MEDICINE

Upon completion of the course, the third year MBBS students must be able to:

CO1: Elucidate the notion of health and illness, strategies aimed at fostering well-being and forestalling ailments as outlined in National and State Health Initiatives.

CO2: Elaborate on the physical, social, psychological, economic, and environmental factors that influence health and illness.

CO3: Articulate the fundamental principles of demography, population dynamics, and the burden of diseases on both national and global scales, encompassing health economics and the administration of hospitals.

CO4: Examine epidemiological methodologies and their practical applications in discerning the occurrence and prevalence of both communicable and non-communicable diseases within a community or clinical environment.

CO5: Outline and actively participate in National Health Programs, with particular attention to maternal and child health initiatives.

CO6: Identify, explore, document, strategize, and oversee public health concerns within communities, including issues like malnutrition and emergency situations.

CO7: Extract the frameworks of health information systems and the execution of health administration and educational initiatives within communities.

GENERAL MEDICINE

Upon completion of the course, the final year MBBS students must demonstrate ability to do the following:

CO1: Elaborate on the underlying pathophysiology, epidemiological characteristics, clinical manifestations, diagnostic protocols, and therapeutic approaches for various diseases.

CO2: Conduct a comprehensive history-taking session and physical examination of an adult patient, arriving at an accurate clinical diagnosis, and prescribing and interpreting relevant laboratory examinations.


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CO3: Initiate cost-effective treatment plans guided by principles of rational drug use, understanding necessary medical interventions, and advocating preventive measures.

CO4: Undertake regular follow-ups of patients with medical conditions and make appropriate referrals when deemed necessary.

CO5: Demonstrate effective communication skills to educate and counsel patients and their families regarding their health conditions.

CO6: Effectively manage common medical emergencies and facilitate referrals as warranted.

CO7: Independently perform routine medical procedures with a focus on patient safety and well-being.

CO8: Stay updated with the latest advancements in the field of medicine.

GENERAL SURGERY

Upon completion of the course, the final year MBBS student must be able to:

CO1: Explain the anatomical and physiological foundations, diagnostic principles, and treatment strategies for prevalent surgical needs in both adults and children.

CO2: Implement principles of cleanliness, sterilization, disinfection, judicious use of prophylaxis, antibiotic therapy, and universal precautions in surgical settings.

CO3: Choose, calculate, and administer intravenous fluids, electrolytes, blood, and blood products appropriately based on clinical indications.

CO4: Identify common malignancies in the Indian context, outlining preventive measures, early detection strategies, and treatment modalities.

CO5: Conduct routine diagnostic and surgical procedures at the primary healthcare level.

CO6: Differentiate between acute and chronic surgical conditions, recognizing, stabilizing, and providing basic and advanced life support to trauma patients.

CO7: Secure informed consent and provide pre-operative counseling to patients undergoing surgical procedures.

CO8: Demonstrate a dedication to enhancing the quality and safety of surgical practices while prioritizing patient welfare.

PEDIATRICS

Upon completion of the course, the final MBBS student must demonstrate ability to:

CO1: Discuss, evaluate, and advocate for the optimal growth, development, and nutritional requirements of children and adolescents while recognizing deviations from the norm.


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CO2: Identify and deliver both emergency and routine ambulatory care for neonates, infants, children, and adolescents, referring cases as necessary to higher levels of care.

CO3: Diagnose and treat common pediatric and neonatal illnesses appropriately.

CO4: Perform necessary procedures for children of all age groups within primary care settings.

CO5: Recognize children with special needs and make appropriate referrals.

CO6: Define, identify, and categorize high-risk neonates, including skills in neonatal resuscitation, assessing gestational age, and providing care for healthy newborns.

CO7: Demonstrate advocacy for children's health and disease prevention while actively engaging in national programs related to child health, aligning with the Integrated Management of Neonatal and Childhood Illnesses (IMNCI) Strategy.

CO8: Outline the immunization schedule (IAP/NIP) and provide explanations about individual vaccines.

OBSTETRICS AND GYNAECOLOGY

Upon completion of the course, the final MBBS students must demonstrate ability to:

CO1: Outline prevalent obstetric and gynecological issues alongside preventive measures for gynecological infections.

CO2: Gather a comprehensive gynecological history, conduct relevant physical and pelvic examinations including PAP smears, and diagnose and manage common reproductive tract infections within primary care settings.

CO3: Explain the normal physiological changes occurring during pregnancy and postpartum periods, as well as the typical mechanisms of labor.

CO4: Perform uncomplicated deliveries, adhering to safe delivery protocols in both primary and secondary care settings, and administer early neonatal resuscitation as needed.

CO5: Identify labor complications, provide primary care interventions, recognize high-risk pregnancies, and ensure timely referrals when necessary.

CO6: Discuss the indications, techniques, and potential complications associated with surgeries such as cesarean section, laparotomy, abdominal and vaginal hysterectomy, and medical termination of pregnancy.

CO7: Select and prescribe safe medications during pregnancy and lactation.


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CO8: Provide counseling and antenatal care, as well as postnatal care including guidance on breastfeeding.

CO9: Apply medico-legal principles and ethical considerations pertinent to obstetrics and gynecological procedures such as tubectomy, medical termination of pregnancy, pre-conception, and prenatal diagnostic techniques, while upholding patient confidentiality.

CO10: Provide guidance and support to couples in choosing suitable contraception methods.

CO11: Interpret laboratory and radiological test results relevant to obstetric patient care.

CO12: Recognize the healthcare needs of women and adolescents and deliver the professional responsibilities in accordance with ongoing national health programs.


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