

SRI BALAJI VIDYAPEETH

(Deemed – to be - University u/s 3of UGC Act, 1956)

Pillaiyarkuppam, Puducherry - 607 402

Mahatma Gandhi Medical College and Research Institute



COMPETENCY BASED POSTGRADUATE MEDICAL CURRICULUM M.D. PHYSIOLOGY (2020 Onwards)

(As approved at the 30th Academic Council Meeting held on 28th September 2020)

Preface

Following the promulgation of the much awaited Competency Based Medical Education (CBME) for post graduate by the Medical Council of India (MCI)(superseded by the Board of Governors), adoption of CBME for implementing post-graduate programs is a welcome move. Sri Balaji Vidyapeeth (SBV), Puducherry, Deemed to be University, declared u/s 3 of the UGC Act. and accredited by the NAAC with A grade, takes immense privilege in preparing such an unique document in a comprehensive manner and most importantly the onus is on the Indian setting for the first time, with regard to the competency based medical education for post graduate programs that are being offered in the broad specialty departments. SBV is committed to making cardinal contributions that would be realised by exploring newer vistas. Thus, post graduate medical education in the country could be made to scale greater heights and SBV is poised to show the way in this direction.

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Preface

Following roll out of much awaited Competency-Based Medical Education (CBME) for undergraduate by the Medical Council of India (MCI)(superseded by the Board of Governors) , adoption of CBME for post-graduate by it is welcome move.

The MCI has laid down the syllabus course wise, listing competency to some extent, teaching learning methods and the assessment methods as well. The MCI describes competencies in three domains (knowledge, skill, and attitude). However, the most significant problem in competency-based training is the development of appropriate assessment tools.

The salient feature of this document is defining the program educational objectives (PEO) for its postgraduate program as a whole, defining program outcomes (PO) based on the competencies to be practiced by the specialist, course outcomes (CO) and program specific sub-competencies and their progression in the form of milestones. The compilation of the milestone description leads to the formation of the required syllabus. This allows the mentors to monitor the progress in sub-competency milestone levels. It also defines milestone in five levels, for each sub-competency. Although MCI has described three domains of competencies, the domain 'Attitude' is elaborated into 4 more competencies for ease of assessment. The six competency model (ACGME) for residency education: Medical Knowledge, Patient Care, Practice Based Learning and Improvement, Systems Based Practice, Professionalism, Inter personal and Communication Skills gives better clarity and in-depth explanation. The sub-competency and their milestone levels are mapped into the entrustable professional activities (EPA) that are specific to the individual postgraduate program. To make the program more relevant, PEO, PO, CO and EPAs are mapped with each other. EPA's which are activity based are used for formative assessment and graded. EPA assessment is based on workplace based assessment (WPBA), multisource feedback (MSF) and e-portfolio. A great emphasis is given on monitoring the progress in acquisition of knowledge, skill and attitude through various appraisal forms including e-portfolios during three years of residency period.



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Foreword

This work is an enthusiastic celebration of competency-based post-graduate curriculum rolled out by MCI in September 2019.

A customary look at the work makes it amply clear that the faculty, Department of Physiology at MGMCRI worked tirelessly not only to materialize the MCI recommendations but also went ahead to include many additional desirable elements. These elements include chiseled out sub-competencies, milestones, entrustable professional activities along with welcome improvisations in the existing methods of evaluation and feedback. These new inclusions will certainly be the guiding standards for the postgraduate students in their professional life.

The present draft is unique in the sense that it not only delineates the program's educational objectives, program outcomes, and course objectives but also maps them with each other establishing a clear hierarchical link between the envisioned and the planned curriculum. This distinctive feature of the present draft will definitely provide a guiding framework for the teachers and the policymakers.

The description of entrustable professional activity (EPA) with relevant domains of competence and domain critical behavior is another compelling feature of the present work. The intelligibly defined EPAs and their mapping with competencies, sub-competencies, and milestones are evidence of the time and effort invested by the team during this endeavor. The meticulously defined five-level milestones for each EPA will remain the guiding principle for the postgraduate students even after the completion of their master's degree.

Another highlight of the work is that the team utilized this opportunity to come up with a curriculum draft that provides learning opportunities to the students that extend way beyond the factual content in physiology. The introduction of ethics and professionalism as core competencies will certainly inculcate the positive attitudes of open-mindedness, intellectual honesty, and modesty amongst the post-graduate students.

To ensure that the students are continuously assessed and reflect upon their learning, e-portfolio is an integral part of this curriculum. The e-portfolio will surely ascertain that the students will make midway course corrections as and when required during their training.

One of the overriding achievements of the contributors to the draft is that besides providing model question papers for theory and practical examination they also incorporated standard forms for evaluation and feedback. These forms will be of immense help for the students as well as the teachers.

Perhaps the most significant difference between this curriculum draft and its older versions is that it provides an opportunity for the learner to objectively quantify what has been learned. In addition to that, it also enables them to identify the gaps in the learning at the earliest.

I think the team of the physiology department at MGMCRI can be confident that there will be many grateful teachers and postgraduate students who will gain a holistic perspective of the master's degree in physiology due to this work.

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This document named postgraduate curriculum for the MD Physiology has been prepared in the accordance with the document notified by Board of Governors in suppression of MCI <https://www.mciindia.org/CMS/information-desk/for-colleges/pg-curricula-2>. This document has been prepared by the Department of Physiology, MGMCRI, Puducherry, ratified by the Board of Studies on 06 May 2020 and approved by Academic Council of Sri Balaji Vidyapeeth, a deemed to be university, accredited 'A' Grade by NAAC

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Sri Balaji University
Department of Physiology
Post- Graduate Program

1. Preamble

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training. The purpose of the training in Physiology is to produce experts with necessary knowledge, skills and attitude to impart education and to carry out research in Physiology, be able to serve the community as competent physiologists and render appropriate advice/service to the clinicians as and when it is required.

The purpose of this document is to provide teachers and learners illustrative guideline to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

2. Program Educational Objectives (PEO)

PEO1: Specialist who can provide comprehensive care related to physiology to the community.

PEO2: Leader and team member who understands health care system and acts to provide safe patient care with accountability and responsibility.

PEO3: Communicator possessing adequate communication skill to convey required information in an appropriate manner in various health care setting.

PEO4: Lifelong learner keen on updating oneself regarding the advancement in the health care field and able to perform the role of a researcher and a teacher

PEO5: Professional who understands and follows the principle of bio-ethics/ethics related to health care system.

3. Program Outcome (PO)

After three years of residency program a postgraduate should be able to

1. Teach effectively the basic physiological mechanisms of human body with reference to their implications in the pathogenesis of diseases and management to undergraduate medical, paramedical and other basic science students.
2. Serve the community as competent physiologist by imparting knowledge on physiological understanding of health problems.
3. Interact with the allied departments and render services in advanced laboratory investigations.
4. Render appropriate advice/service to the clinicians as and when it is required.
5. Possess necessary knowledge, skills and attitude to carry out research in Physiology,
6. Apply the principles of professionalism and ethics in rendering the service

4. Course Objectives (CO)

4.1 Course 1 (C1): General Physiology including history of Physiology

Objectives: At the end of three years the post graduate student should be able to:

- C1.1 Demonstrate in-depth knowledge of principles of general physiology as applicable to systemic physiology
- C1.2 Demonstrate the ability to teach effectively using appropriate teaching-learning resources the principles of general physiology to undergraduate medical, paramedical and other basic science students.
- C1.3 Demonstrate self-awareness and personal development in routine conduct, in various teaching-learning activities.
- C1.4 Communicate effectively with peers, students and teachers in various teaching-learning activities.

4.2. Course 2 (C2): Systemic Physiology (system providing transport, nutrition and energy)

Objectives: At the end of three years the post graduate student should be able to:

- C2.1 Demonstrate in-depth knowledge of systemic physiology related to physiological systems providing transport, nutrition and energy.
- C2.2 Demonstrate the ability to teach effectively using appropriate teaching-learning resources the basic physiological mechanisms of human body related to providing transport, nutrition and energy to undergraduate medical, paramedical and other basic science students.
- C2.3 Explain how the knowledge of systemic physiology related to physiological systems providing transport, nutrition and energy can be effectively used in a various clinical setting to solve diagnostic and therapeutic problems.
- C2.4 Demonstrate the skills for evaluating the physiological functions related to systems providing transport, nutrition and energy.
- C2.5 Acquire administrative skills to set up concerned department / laboratories for the physiological functions related to systems providing transport, nutrition and energy.
- C2.6 Interact with the allied departments and render services in advanced laboratory investigations related to systems providing transport, nutrition and energy.
- C2.7 Communicate effectively with peers, students and teachers with self-awareness in various teaching-learning activities.
- C2.8 Contribute to society by imparting knowledge on physiological understanding of health problems.

4.3. Course 3 (C3): Systemic Physiology (system concerned with regulation, neural control and procreation)

Objectives: At the end of three years the post graduate student should be able to:

- C3.1 Demonstrate in-depth knowledge of systemic physiology related to physiological systems concerned with regulation, neural control and procreation
- C3.2 Demonstrate the ability to teach effectively using appropriate

teaching-learning resources the basic physiological mechanisms of human body related to regulation, neural control and procreation to undergraduate medical, paramedical and other basic science students.

- C3.3** Explain how the knowledge of systemic physiology related to physiological systems concerned with regulation, neural control and procreation can be effectively used in a various clinical settings to solve diagnostic and therapeutic problems.
- C3.4** Demonstrate the skills for evaluating the various neural and endocrine regulatory functions and reproductive functions.
- C3.5** Acquire administrative skills to set up concerned department / laboratories for assessing the various neural and endocrine regulatory functions and reproductive functions.
- C3.6** Interact with the allied departments and render services in advanced laboratory investigations related to regulation, neural control and procreation.
- C3.7** Communicate effectively with peers, students and teachers with self-awareness in various teaching-learning activities.
- C3.8** Contribute to society by imparting knowledge on physiological understanding of health problems.

4.4. Course 4 (C4): Applied Physiology including recent advances

Objectives: At the end of three years the post graduate student should be able to:

- C4.1** Demonstrate the ability to teach effectively using appropriate teaching-learning resources the implication of physiological knowledge in the pathogenesis of diseases and management to undergraduate medical, paramedical and other basic science students.
- C4.2** Demonstrate the skill of using the library facilities and online and offline literature databases for searching, acquiring, saving and retrieving information.
- C4.3** Plan and conduct relevant clinical/experimental research which may have significant bearing on human health and patient care.
- C4.4** Conduct relevant clinical/experimental research which may have significant bearing on human health and patient care.
- C4.5** Interpret the research findings in the light of its basic and applied significance.
- C4.6** Evaluate research publications critically.
- C4.7** Acquire skills in conducting collaborative research in the field of physiology with allied sciences, clinical sciences and biomedical engineering.
- C4.8** Function as a member of a teaching or research team

Table1. Mapping of PEO, PO and CO

	PEO1		PEO2	PEO3	PEO4	PEO5
	PO1	PO2	PO3	PO4	PO5	PO6
C1	Y	Y				Y
C2	Y	Y	Y		Y	Y
C3	Y	Y	Y		Y	Y
C4	Y			Y		Y

All courses run concurrently for 3 years with a summative assessment at the end of 3 years. The program is competency based and the competencies, sub-competencies and milestones are detailed. These are mapped to the Entrustable professional activities (EPA) identified as essential for a specialist. Formative assessment is carried out every three months using appropriate tools, for identifying eligibility for transfer of trust.

5. Competencies, Sub-competencies and Milestones

At the end of the MD course in Physiology, the student should have acquired various competencies i.e. medical knowledge, patient care, interpersonal communication skill, system-based practice, practice-based learning and implementation and professionalism. Details of each with milestones as level are described below. (Table 2)

Table 2: Description of Competencies, Sub-competencies and Milestones

Medical Knowledge (MK):

Demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioural sciences, as well as the application of this knowledge to patient care.

❖ MK1: Theoretical physiology knowledge.

Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates background theoretical knowledge of physiology. Demonstrates background knowledge on various tests which may be performed for assessing physiological functions	Applies the physiological knowledge to understand the pathophysiological basis of disease	Teaches undergraduates basic knowledge of physiology	Applies advanced knowledge of cellular, and molecular and systemic physiology in critical problem solving. Teaches co postgraduates	Theorizes the unknown mechanism of various physiological phenomenon.

❖ MK 2: Practical physiology knowledge

Level 1	Level 2	Level 3	Level 4	Level 5
Identifies and lists the tests which may be used for evaluating physiological functions in different pathological conditions. Describes the basic preparatory requirements for conducting the tests. Describes the indications and contraindications of the tests	Demonstrates the procedure of recording various physiological variables	Applies the knowledge of physiology for interpreting the findings following evidence-based guidelines with assistance. Identifies the experimental, physiological and pathological variations which may affect the test results.	Independently interprets the findings of test results distinguishing normal from abnormal findings	Devises newer accurate tests/methods for evaluating physiological processes.

❖ **MK3: Pedagogical knowledge.**

Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates the basic knowledge of pedagogical principles, teaching-learning and assessment tools in micro teaching session	Applies the content and pedagogical knowledge while teaching students in classes for paramedical students	Teaches medical undergraduates using appropriate teaching-learning tool (e.g. blackboard/PPTs) after presentation to the faculty and incorporating the obtained feedback	Creates teaching-learning lesson plans based on content and pedagogical knowledge. Creates assessment item/plan for undergraduate evaluation.	Devises novel teaching-learning and assessment methods based on the local needs. Identifies and uses appropriate teaching-learning methods based on local needs. Incorporates advances in technology for teaching

Patient Care (PC): Provide patient-centered care that is compassionate, appropriate, and effective for health problems and the promotion of health)

PC1: Reporting considered essential for the area of practice.

Level 1	Level 2	Level 3	Level 4	Level 5
Identifies the key elements of a report with respect to the test involved	Identifies the physiological and pathological variations which may affect various elements of the report with respect to the test involved	Produces reports for simple cases with assistance	Independently generates reports for simple cases and identifies complicated cases with assistance	Independently generates reports for complicated cases

PC2: Perform diagnostic considered essential for the area of practice.

Level 1	Level 2	Level 3	Level 4	Level 5
Discusses importance of diagnoses and test results in patient care	Identifies pertinent test results and correlates to clinical findings to develop a differential diagnosis with assistance.	Consistently integrates test results with clinical findings to refine differential and propose a diagnosis with assistance	Accurately interprets the test results and makes a differential diagnosis independently for simple cases	Accurately interprets the test results and makes a differential diagnosis independently for complicated cases

Interpersonal Communication Skills (ICS):

Demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with seniors, students and health professionals

ICS 1: overcoming barriers of communication

Level 1	Level 2	Level 3	Level 4	Level 5
Uses language and nonverbal behavior to demonstrate respect and establish rapport. Interprets verbal and non-verbal messages of others correctly and takes proper course of action	Identifies common barriers to effective communication (e.g., language, disability) while accurately communicating own role within the health care system	Communicates to the patients/students/colleagues for various requirements while overcoming the barriers to communication under supervision	Communicates with others to identify, define and solve problems including making decisions about the best course of action	Works with others to find a mutually agreeable (win/win) outcome. Works with others to resolve interpersonal conflict and disagreements in a positive way.

ICS 2: Communicate effectively with colleagues, seniors within specialty, other health professionals, and health-related agencies leading to teamwork

Level 1	Level 2	Level 3	Level 4	Level 5
Understands the importance of relationship development, information gathering and sharing, and teamwork.	Demonstrates adequate listening skills	Communicates effectively during seminars and journal club	Capable of communication in the challenging situations	Role models for effective communication to junior colleagues

ICS 3: Communicate effectively with students

Level 1	Level 2	Level 3	Level 4	Level 5
Create positive environment	Reinforce active learning	Ask open ended questions	Reflective learning opportunities	Task and activity for critical thinking

System Based Practice (SBP):

Demonstrate the ability to follow the standard operating procedures relevant to practices of the organisations

❖ SBP1: Equipment management and informatics

Level 1	Level 2	Level 3	Level 4	Level 5
Discusses the role of the physiologist in laboratory initiatives	Demonstrates familiarity with basic technical concepts of hardware, operating systems, databases, and software for general purpose applications	Understands laboratory specific software, key technical concepts and interfaces, calibration and standardisation of equipment's.	Participates in operational and strategy meetings, troubleshooting with information technology staff members	Actively participates to establish a laboratory in at least one of the specialities of physiology.

❖ **SBP2: Quality improvement (teaching/patient care)**

Level 1	Level 2	Level 3	Level 4	Level 5
Identifies departmental and/or institutional quality improvement activities	Participates in departmental and institutional quality improvement activities	Identifies errors in case of system misses and failure and engages in scholarly activities of root cause analysis in errors of omission and commission in system failure	Conducts analysis of events and offers error prevention strategies (simulated)	Consistently conducts analysis of events and offers error prevention strategies (actual)

Practice-based Learning and Improvement (PBLI):

Demonstrate the commitment to learn by practice and improve upon their ability

❖ **PBLI 1: Self-directed Learning/Critical Appraisal of Medical Literature**

Level 1	Level 2	Level 3	Level 4	Level 5
Acknowledges gaps in own knowledge and expertise in physiology	Incorporates feedback for improving knowledge and skill gap	Develops a learning plan based on the knowledge and expertise gap and the obtained feedback.	Implements the learning plans successfully to bridge the gap.	Applies the principles of self-directed learning in identifying the knowledge and expertise gaps in physiology knowledge in general.

❖ **PBLI 2 : Evidence based practice and research**

Level 1	Level 2	Level 3	Level 4	Level 5
Uses information technology to search and access relevant medical information	Interpret the research findings in the light of its basic and applied significance.	Evaluates research publications critically. Uses scholarly articles and guidelines to find answers to knowledge gaps.	Engages in scholarly activity regarding evidence-based medicine while evaluating it critically.	Plans and conducts relevant clinical/experimental research which may have significant bearing on human health and patient care.

Professionalism (P):

Demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles

❖ **P 1: Practice of ethical principles**

Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates knowledge of the ethical principles	Demonstrates insight into ethical behaviour in routine situations	Demonstrates ethical professional behaviour in complex or stressful situations	Recognizes the errors in his ethical behaviour and self regulates.	Coaches co-post-graduates on the principles of ethics and ethical behaviour

P2: Accountability and Responsiveness to the Needs of students, Society, and the Profession

Level 1	Level 2	Level 3	Level 4	Level 5
Consistently demonstrates professional behavior, including dress and timeliness, leave with information	Responds promptly to instructions, requests, or reminders to complete tasks and responsibilities	Recognizes situations that may impact own ability to complete tasks and responsibilities in a timely manner and describes the impact on team with assistance	Recognizes situations that may impact own ability to complete tasks and responsibilities and takes corrective actions independently	Anticipates and intervenes in situations that may impact others' ability to complete tasks and responsibilities in a timely manner Takes ownership of system outcomes

P3: Behaviour and self-regulation

Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates compassion, sensitivity, and responsiveness and non-discriminatory behaviour to students in and out of classes, patients, teaching and non-teaching staff.	Demonstrates compassionate behaviour in day to day activities even in case of disagreements	Takes responsibility for own professionalism lapses.	Recognizes the errors in his own professional behaviour and self regulates.	Mentors other co-postgraduates in the professional behaviour

6. Syllabus

6.1. Course 1: General and Cellular Physiology including Genetic Basis and Historical perspectives

Course 1: General and Cellular Physiology including Genetic Basis and Historical perspectives

6.1.1. General and Cellular Physiology

- Cell structure-cell membrane, cytoplasm, nucleus, fluid mosaic model of membrane structure
- Passive transport-diffusion, osmosis
- Active transport-primary active transport processes, secondary active transport processes
- Vesicular transport-endocytosis, exocytosis, transcytosis, Other transport processes
- Genesis of membrane potential, recording of membrane potential

6.1.2. Various principles of Physics and Physical Chemistry involved in Physiological phenomenon and Medical Genetics

- Haemodynamics-General principles governing blood flow- flow—pressure—resistance relationship, Poiseuille's law, blood flow and pressure gradient relationship, flow and resistance relationship, velocity of blood flow, blood flow: types, measurement and distribution
- Total body water, Measurement of body fluid volume, Body electrolytes
- Structural and functional characteristics of substrate for genetics-chromosomes, structure and function of DNA and RNA
- Genes, gene expression: central dogma, regulation of gene expression
- Applied genetics- genetic engineering/recombinant DNA technology, Polymerase chain reaction, blotting techniques, cloning, apoptosis
- Molecular genetics and medicine-mutations and genetic human diseases, genetic screening, genetics and cancer, Gene therapy.

6.1.3. History of Physiology

- Historical background, various historical discoveries and the key scientist and their physiological experiment

6.1.4. Biostatistics

● Basic Course in Biomedical Research, Data collection and analysis, Scientific communication

6.1.5. Growth and Development including aging

- Growth curves, Factors affecting growth
- Behaviour pattern, Developmental and intelligent quotient, Milestones, Growth factors
- Theories of ageing, Age-related changes in different organ systems, Modulating the process of aging

6.1.6. Excretion, pH, water and Electrolyte balance.

- Kidneys: Functional Anatomy and Blood Flow
- Mechanism of Urine Formation: Glomerular Filtration and Tubular Transport
- Concentration, Dilution and Acidification of Urine
- Regulation of Body Fluid Osmolality, Composition and Volume
- Physiology of Acid–Base Balance
- Applied Renal Physiology Including Renal Function Tests
- Physiology of Micturition
- Acids and bases, Concept of pH and H⁺ concentration, H⁺ concentration and pH of biological fluids
- Maintenance of blood pH, Blood and plasma pH, Dietary and metabolic production of acids and bases
- Defences against changes in H⁺ concentration
- Buffer system: Primary defence, Respiratory mechanism for pH regulation, Renal mechanism for pH regulation
- Acid–base disorders
- Analysis and clinical evaluation of acid–base disorders

6.1.7. Biochemistry, Micro-anatomy

- Biochemistry: All clinical biochemical test and basis of operation of various equipment's and interpretation of data
- Micro-anatomy: Functional anatomy of individual organ, histology of trachea, lung, liver, kidney, uterus, testis, thyroid gland, adrenal gland, spinal cord, medulla, cerebral cortex, cerebellum

6.2. Course 2: Systemic Physiology (system providing transport, nutrition and energy) including comparative Physiology.

6.2.1. Blood and Immunity

- Plasma- composition, serum, plasma proteins
- Characteristic features of red blood cells- functional morphology, composition and metabolism of RBC
- Formation of red blood cells, haemoglobin
- Red cell fragility, life span and fate of red blood cells
- Bilirubin and jaundice, Anaemias,
- Types of white blood cells- formation of white blood cells, morphology, life span, functions and
- Variations in counts of WBC

- Mononuclear–phagocytic system- lymphoid organs
- Immunity-innate immunity, acquired immunity
- Antigens, antibodies
- Development of immune response, Cytokines
- Other immune mechanism related aspects- immune tolerance, autoimmunity, hypersensitivity, immunodeficiency diseases
- Platelets-structure and composition, properties and functions, normal count and variations, formation of platelets
- Haemostasis
- Blood coagulation-clotting factors, mechanism of coagulation, blood clot retraction
- Anti haemostatic mechanisms-factors preventing platelet aggregation, circulatory anticoagulants, fibrinolytic mechanism, anticoagulants
- Bleeding disorders
- Blood group-classical ABO blood grouping system, rhesus (Rh) blood grouping system, clinical applications of blood grouping
- Blood transfusion

6.2.2. Cardiovascular System.

- Functional Anatomy of Heart and Physiology of Cardiac Muscle
- Process of excitability and contractility
- Properties of cardiac muscle
- Origin and Spread of Cardiac impulse and Electrocardiography
- Cardiac Cycle, Cardiac Output and Venous Return
- Blood pressure, Cardiovascular Regulation
- Coronary circulation
- Cerebral circulation
- Cutaneous, splanchnic and skeletal muscle circulation
- Fetal and neonatal circulation

6.2.3. Respiratory System.

- Respiratory Tract: Structure and Functions
- Pulmonary Ventilation
- Pulmonary Circulation
- Pulmonary Diffusion
- Transport of Gases

- Regulation of Respiration
- Respiration: Applied Aspects

6.2.4. Gastro- Intestinal Tract (GIT) and dietary requirements.

- Functional Organization of GI System, smooth muscle – types and properties, Principles of GI Regulations and secretion
- Principles of GI Secretion and Secretion of Saliva
- Gastric Secretion
- Pancreatic Secretion
- Physiology of Liver, Liver Function Tests and Pathophysiology of Jaundice
- Biliary Secretion
- Intestinal Secretion
- Secretion of Large Intestine
- Chewing and Deglutition
- Esophageal Motility
- Gastric Motility
- Small Intestinal Motility
- Motility of Large Intestine
- Digestion and Absorption

6.3. Course 3: Systemic Physiology (system concerned with procreation, regulation and neural control)

6.3.1. Nerve-Muscle Physiology including muscle mechanics.

- Nerve
- Neuromuscular Junction
- Skeletal Muscle

6.3.2. Endocrine Physiology

- General Principles of Endocrinal System
- Endocrinal Functions of Hypothalamus and Pituitary Gland
- Thyroid Gland
- Endocrinal Control of Calcium Metabolism and Bone Physiology
- Adrenal Glands
- Pancreatic and Gastrointestinal Hormones
- Endocrinal Functions of Other Organs and Local Hormones

6.3.3. Nervous System (Central, peripheral and autonomic)

- Functional Organization of Nervous System
- Synaptic Transmission
- Sensory System and Physiology of Receptors
- Sensory Communication to Spinal Cord
- Ascending Pathways
 - Physiology of Pain, Itch and Temperature
 - Trigeminal System
 - Thalamus
 - Sensory Cortex
 - Sensory Abnormalities
 - Muscle Spindle and Golgi Tendon Organ
 - Spinal Reflexes
- Descending Pathway
- Basal Ganglia
- Cerebellum
- Vestibular Apparatus
- Regulation of Posture and Movement
- Hypothalamus
- Reticular Activating System
- Electroencephalogram and Sleep
- Limbic System
- Physiology of Learning and Memory
- Physiology of Language and Speech
- Association Cortex, Cerebral Asymmetry, Lobes of the Brain, and Cortical Plasticity
- Cerebrospinal Fluid

6.3.4. Special Senses

- Sense of Vision
- Sense of Hearing
- Chemical Senses: Smell and Taste

6.3.5. Reproduction & family planning/foetal & neonatal Physiology

- Sexual Growth and Development

- Male Reproductive Physiology
- Female Reproductive Physiology
- Physiology of Coitus, Pregnancy and Parturition
- Physiology of Lactation
- Physiology of Contraception
- Exchange between maternal and fetal blood across placental membrane
- Systemic physiology of fetus, newborn and childhood
 - a. Cardiovascular physiology-fetal circulation, neonatal circulation, status of cardiovascular system after birth, congenital heart diseases
 - b. Respiratory physiology-fetal respiration, respiratory adjustments at birth, status of respiratory system after birth
 - c. Blood and immune mechanisms-erythropoiesis, leucopoiesis and thrombopoiesis, fetal and adult haemoglobin, characteristics of blood in new born, physiological anaemia
 - d. Nervous system
 - e. Gastrointestinal physiology- GIT: during fetal life, after birth, renal physiology and fluid and acid– base
 - f. Balance, temperature regulation in new born and infants

6.4. Course 4: Applied Physiology including recent advances

6.4.1. Patho-physiology pertaining to systemic Physiology

6.4.2. Physiological basis of various clinical investigation

Nerve conduction study, electromyography, autonomic function test, heart rate variability, evoked potential

6.4.3. Interaction of human body in ambient environment

High altitude, space and deep sea

6.4.4. Sports physiology

Exercise: types and grading, adjustments to exercise

- Responses to exercise - oxygen consumption during exercise, oxygen deficit and O₂ debt
- cardiovascular responses to exercise- skeletal muscle blood flow, redistribution of blood flow
- cardiac output, blood pressure changes during exercise, changes in blood volume during exercise
- Respiratory responses to exercise- increase in pulmonary ventilation, increase in oxygen uptake in the lungs

- Changes at the tissue level endocrinal responses to exercise
- Effects of training- on cardiovascular system, respiratory system, skeletal muscle, psychological effects, metabolic effects

6.4.5. Yoga and Meditation

Physiology of yoga, physiological basis of yoga in treating pathological condition

6.4.6. Recent advances relevant to physiology

Diagnostic and therapeutic technique relevant to physiology

6.4.7. Social responsibilities of physiologist

Role and responsibilities of Physiologist

6.4.8. Practical syllabus

I. Haematology Experiments

- Estimation of haemoglobin
- Determination of Total Erythrocyte (RBC) Count and RBC Indices (Blood Standards)
- Determination of Total Leucocytes (WBC) Count/ TLC
- Preparation of a peripheral Blood Smear and Determination of Differential Leucocyte Count: DLC
- Determination of Arneeth Count
- Determination of Bleeding Time (BT) and Clotting Time (CT)
- Determination of Blood groups (A, B, O and Rh system)
- Determination of Erythrocyte Sedimentation Rate (ESR) and Packed cell volume (PCV)
- Determination of Osmotic Fragility of Red Blood Cells
- Determination of Platelet Count
- Determination of Reticulocyte Count
- Determination of Absolute Eosinophil Count
- Study of Haemopoietic Cells present in the Bone Marrow

II. Animal Experiments (All animal experiments will be in compliance with Govt. of India Regulations, notified from time to time). Experiments in Amphibian/Dog/Cat will be conducted by computer assisted simulation models/ facilities. Other experiments will be performed as permissible by CPCSEA guidelines.

A. Amphibian (Frog) Experiments

- Effect of temperature on simple muscle twitch.
- Effect of two successive stimuli (of same strength) on skeletal muscle.
- Effect of increasing strength of stimuli on skeletal muscle.
- Effect of increasing frequency of stimuli on skeletal muscle (genesis of tetanus).

- Effect of free load and after load on skeletal muscle.
- Effect of repeated stimuli on skeletal muscle (study of phenomenon of Fatigue).
- Study of isometric contraction in skeletal muscle.
- Determination of conduction velocity of sciatic nerve and effect of variables on it.
- Properties of cardiac muscle – Refractory period, All-or-None Law, extrasystole and compensatory pause, beneficial effect.
- Regulation of Heart, Vagus dissection and effect of Vagal and WCL stimulation.
- Effect of physiological and pharmacological variables on intact frog's heart.
- Perfusion of isolated frog's heart-role of sodium, potassium, calcium ions and drugs.
- Perfusion of blood vessels in the frog.
- Capillary circulation (Frog Web).
- Postural and protective reflex in the frog.

B. Mammalian Experiments (Dog/Rabbit/Guinea pig/Rat/Mice)

- General management of mammalian experiments.
- Recording of heart rate, blood pressure and respiration and study the effects of various factors; drugs; asphyxia; occlusion of common carotid artery.
- Effect of stimulation of central and peripheral end of vagus on arterial blood pressure and respiration after vagotomy.
- Effect of stimulation and distension of carotid sinus on blood pressure and respiration.
- Effect of stimulation of splanchnic nerve.
- Effect of stimulation of peripheral somatic nerve (sciatic nerve).
- Study of hypovolemic shock and its reversal.
- Perfusion of isolated mammalian heart and study the effects of drugs and ions.
- Recording of Isolated Intestinal movement and tone and studying the effect of drugs and ions.
- Study of various stages of menstrual cycle, cervical smear and vaginal smear.

III. Human Physiology

Clinical Physiology

- Physiological principles of clinical examination.
- General Physical examination, physiological basis of some clinical symptoms and signs.
- General principles of Inspection/Palpation/Percussion/Auscultation.

Nerve muscle physiology

- Ergography and hand grip spring dynamography and study of human fatigue.

- Recording of electromyography (EMG) and its application.
- Recording of nerve conduction.

Cardiovascular system (CVS)

- Clinical examination of CVS.
- Examination of arterial & venous pulses.
- Measurements of arterial blood pressure and effect of head-up/head-down tilt.
- Recording of 12 lead Electrocardiography (ECG) and its interpretation.
- Measurement of blood flow.

Respiratory system

- Clinical examination of respiratory system.
- Stethography – study of respiratory movements and effect of various factors.
- Assessment of respiratory functions (spirometry, vitalography, and gas analysis).
- Measurement of BMR.
- Cardio pulmonary resuscitation (CPR) and Artificial respiration.

Gastrointestinal system: Clinical examination of abdomen.

Integrative Physiology / Excretory system

- Recording of body temperature/effect of exposure to cold and hot environment
- Studies in stimulated environment - microgravity; high altitude; hot and cold environment.
- Human studies involving sweat, salivation and urine.

Reproductive system

- Determination of ovulation time by basal body temperature chart and pregnancy diagnostic test - Immunological Tests.
- Semen analysis: sperm count and motility.

Nervous System including Special senses

- Clinical examination of the nervous system and its physiological basis.
- Examination of higher mental functions.
- Examination of cranial nerves.
- Examination of sensory system.
- Examination of motor system including reflexes.
- Clinical examination of special senses:
 - (i) Smell and Taste

- (ii) Test for hearing to deafness
- (iii) Physiology of eye:
 - (a) Clinical examination of the eye and pupillary reflex
 - (b) Visual acuity
 - (c) Perimetry – mapping out of visual field and blind spot
 - (d) Accommodation
 - (e) Fundoscopy
 - (f) Colour vision and colour blindness
- Reaction (visual and auditory) and reflex time.
- Electroencephalography (EEG) and Polysomnography
- Autonomic Nervous System (ANS) Testing.
- Neuro-electrodiagnostic techniques:
 - (i) Nerve conduction study.
 - (ii) Visual evoked potential (VEP).
 - (iii) Brainstem auditory evoked potential (B.A.E.P).
 - (iv) Somato-sensory evoked potential (SEP).
 - (v) Motor evoked potential (MEP).

Others

- Construction of dietary chart for growing children, pregnant woman, elderly individuals, hypertensive patients, & diabetes mellitus patients.
- Tests for physical fitness: Cardio – respiratory responses to steady state exercise using
 - (i) Harvard step test
 - (ii) Bicycle Ergometry
 - (iii) Treadmill test for determination of VO₂ max

7. Teaching and Learning Methods

Based on the above laboratory facilities the department can prepare a list of post-graduate experiments pertaining to basic and applied physiology. Active learning should form the mainstay of postgraduate training.

1. There should be seminars (at least 30 per year) along with symposia, group discussions and weekly Journal clubs. Each Journal Club should run for 4 weeks (4 turns) and discuss articles published in indexed journals focusing on their new methodology, interesting results etc. PG student should attend atleast six such journal clubs every year.
2. The Post graduate student should attend at least, 2 symposia/conferences/seminars every year and weekly group discussions.

3. The department should generate liaison with clinical departments and provide routine services for health monitoring and diagnostics (disease) and for periodical posting of Physiology PGs in clinical settings.
 4. The PG students should render special investigative services in their respective area of specialization. In consultation with the concerned clinical departments a 3 month roaster should be made for the postgraduate students to attend the ward rounds of selected cases of pathophysiologic interest for PG teaching.
 5. A postgraduate student in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
 6. The PG students should pay formal and scheduled visits to various hospital laboratories of interest for the purpose of learning.
 7. The student should be trained to generate teaching resource material for UG and develop problem solving modules.
 8. Department should encourage e-learning activities.
 9. The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
 10. Logbooks shall be checked and assessed periodically by the faculty members imparting the training. During the training programme, patient safety is of paramount importance, therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of skills laboratories in medical colleges is mandatory
- ❖ E-portfolio: -Electronic portfolio to be maintained by the residents to record their activities under the section:
 - ❖ EPA
 - ❖ Daily log
 - ❖ Patient care
 - ❖ Procedures
 - ❖ Dissertation
 - ❖ Academic activities(Seminar, symposium, case presentation, journal club)
 - ❖ Co-curricular activities (Conference, CME, Workshop),
 - ❖ Teaching Assignments,
 - ❖ Awards and achievements
 - ❖ Outreach activities.
 - ❖ E-portfolio shall be checked and assessed periodically by the faculty members. This will enable to monitor progress of the residents, their level of attainment of milestones and impart the training accordingly.

- ❖ Writing thesis following appropriate research methodology, ethical clearance and good clinical practice guidelines.
- ❖ The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students
- ❖ A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
- ❖ Department should encourage e-learning activities.

Rotations:

Each post graduate student should undergo minimum of six terms training spread over a period of 03 years. The postings should be as under: -

1. I semester: Department of Physiology to cover (i) General aspects of UG teaching, (ii) Selection of thesis topics and collection of relevant references
2. II Semester: (i) submission of thesis synopsis (ii) Posting in departmental UG – PG laboratories
3. III semester: Posting in clinical departments: Medicine and allied disciplines.
4. IV, V & VI semesters: (i) UG-PG teaching (ii) thesis work.

Note: (1) UG, PG teaching and thesis work to continue throughout the course.

(2) 50% of time during III and IV Semester should be spent in the department of Physiology.

8. Assessment

8.1. Formative Assessment

Formative assessment is continual to assess medical knowledge, patient care, procedural & academic skills, interpersonal communication skills, system-based practice, self-directed learning and professionalism of the activities mentioned every 3/6monthly. EPAs are listed as below (Table 3) with description of each EPA (Table 4). Progress of the students is recorded after discussion with the student in Entrustable Professional Activity (EPA) assessment form) Annexure-1). These EPAs are also mapped with PO and CO. (Table 5)

8.1.1. List of Entrustable Professional Activities

Table 3. List the of Entrustable Professional Activities

EPA No.	Physiology
1.	Evaluate physiological functions in patients
2	Generate patient reports for assessment of physiological functions
3	Teach effectively the basic physiological mechanisms of human body with reference to their implications in the pathogenesis of diseases and management to undergraduate medical, paramedical and other basic science students
4	Interact with the allied departments and render services in advanced laboratory investigations
5	Acquire administrative skills to set up concerned department / laboratories for assessing physiological functions
6	Should be able to serve the community as competent physiologists by imparting physiological understanding of health problems
7	Possess necessary knowledge, skills and attitude to carry out biomedical research to enhance knowledge in basic sciences.
8	Apply the principles of professionalism and ethics in rendering the service

Description of Entrustable Professional Activity with relevant domains of competence, domain critical behaviour

Table 4. EPAs, Competency levels and entrustability

Competency	Pre-Entrustable	Entrustable
EPA 1: Evaluate physiological functions in subjects/patients		
1. Description of the activity: This included a brief rationale and a list of the functions required for the EPA.	Residents should be able to perform an accurate complete or focused history and physical exam in a prioritized, organized manner without supervision and with respect for the patient. The history and physical examination should be tailored to the clinical situation and specific patient encounter. This data gathering and patient interaction activity serves as the basis for clinical work and as the building block for patient evaluation and management.	
Most relevant domains of competence:	MK, P, SBP	
Competencies within each domain critical to entrustment decisions:	MK1, MK2, P1, P3, SBP 1	

Methods of assessment	<ol style="list-style-type: none"> 1. Periodic written exam (Every 6 months) 2. Workplace assessment by Faculty 3. Multisource feedback <ol style="list-style-type: none"> a. Supervisors b. Peers
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MK 1	<p>Fails to demonstrate background theoretical knowledge of physiology.</p> <p>Fails to Demonstrate background knowledge on various tests which may be performed for assessing physiological functions</p> <p>Fails to apply the physiological knowledge to understand the pathophysiological basis of disease</p> <p>Fails to teach undergraduates basic knowledge of physiology</p> <p>Fails to apply advanced knowledge of cellular, and molecular and systemic physiology in critical problem solving. Fails to teach co-postgraduates</p>	<p>Demonstrates background theoretical knowledge of physiology.</p> <p>Demonstrates background knowledge on various tests which may be performed for assessing physiological functions</p> <p>Applies the physiological knowledge to understand the pathophysiological basis of disease</p> <p>Teaches undergraduates basic knowledge of physiology</p> <p>Applies advanced knowledge of cellular, and molecular and systemic physiology in critical problem solving. Teaches co postgraduates</p>
MK 2	<p>Fails to Identify and lists the tests which may be used for evaluating physiological functions in different pathological conditions. Fails to describe the basic preparatory for conducting the tests.</p> <p>Fails to describe the indications and contraindications of the tests</p> <p>Fails to demonstrate the procedure of recording various physiological variables</p> <p>Fails to apply the knowledge of physiology for interpreting the findings following evidence-based guidelines with assistance. Fails to identify the experimental, physiological and pathological variations which may affect the test results.</p> <p>Fails to independently interpret the findings of test results distinguishing normal from abnormal findings</p>	<p>Identifies and lists the tests which may be used for evaluating physiological functions in different pathological conditions. Describes the basic preparatory requirements for conducting the tests.</p> <p>Describes the indications and contraindications of the tests</p> <p>Demonstrates the procedure of recording various physiological variables</p> <p>Applies the knowledge of physiology for interpreting the findings following evidence-based guidelines with assistance. Identifies the experimental, physiological and pathological variations which may affect the test results.</p> <p>Independently interprets the findings of test results distinguishing normal from abnormal findings</p>
P1	<p>Fails to demonstrate knowledge of the ethical principles.</p> <p>Fails to demonstrate insight into ethical behaviour in routine situations</p> <p>Fails to demonstrate ethical professional behaviour in complex or stressful situations</p> <p>Fails to recognize the errors in his ethical behaviour and self regulates</p>	<p>Demonstrates knowledge of the ethical principles.</p> <p>Demonstrates insight into ethical behaviour in routine situations</p> <p>Demonstrates ethical professional behaviour in complex or stressful situations</p> <p>Recognizes the errors in his ethical behaviour and self regulates.</p>

P3	<p>Unable to demonstrate compassion, sensitivity, and responsiveness and non-discriminatory behaviour to students in and out of classes, patients, teaching and non-teaching staff.</p> <p>Unable to demonstrate compassionate behaviour in day to day activities even in case of disagreements</p> <p>Fails to take responsibility for own professionalism lapses</p> <p>Un able to recognize the errors in his own professional behaviour and self regulates.</p>	<p>Demonstrates compassion, sensitivity, and responsiveness and non-discriminatory behaviour to students in and out of classes, patients, teaching and non-teaching staff.</p> <p>Demonstrates compassionate behaviour in day to day activities even in case of disagreements</p> <p>Takes responsibility for own professionalism lapses.</p> <p>Recognizes the errors in his own professional behaviour and self regulates.</p>
SBP 1	<p>Fails to discuss the role of the physiologist in laboratory initiatives</p> <p>Fails to demonstrate familiarity with basic technical concepts of hardware, operating systems, databases, and software for general purpose applications</p> <p>Un able to understand laboratory specific software, key technical concepts and interfaces, calibration and standardisation of equipments.</p> <p>Fails to participate in operational and strategy meetings, troubleshooting with information technology staff members</p>	<p>Discusses the role of the physiologist in laboratory initiatives</p> <p>Demonstrates familiarity with basic technical concepts of hardware, operating systems, databases, and software for general purpose applications</p> <p>Understands laboratory specific software, key technical concepts and interfaces, calibration and standardisation of equipments.</p> <p>Participates in operational and strategy meetings, troubleshooting with information technology staff members</p>

EPA 2: Generate patient reports for assessment of physiological functions	
1. Description of the activity: This included a brief rationale and a list of the functions required for the EPA.	Residents should be able to integrate patient data to formulate an assessment, developing a list of potential diagnoses that can be prioritized and lead to selection of a working diagnosis
2. Most relevant domains of competence:	MK, PC, P, SBP
3. Competencies within each domain critical to entrustment decisions:	MK1, MK2, PC1, PC2, P2, SBP 1
Methods of assessment	<ol style="list-style-type: none"> 1. Periodic written exam (Every 6 months) 2. Workplace assessment by Faculty 3. Multisource feedback <ol style="list-style-type: none"> a. Supervisors b. Peers

Competency	Pre-Entrustabl	Entrustable
MK 1	<p>Fails to demonstrate background theoretical knowledge of physiology.</p> <p>Fails to Demonstrate background knowledge on various tests which may be performed for assessing physiological functions</p> <p>Fails to apply the physiological knowledge to understand the pathophysiological basis of disease Fails to teach undergraduates basic knowledge of physiology</p> <p>Fails to apply advanced knowledge of cellular, and molecular and systemic physiology in critical problem solving.</p> <p>Fails to teach co postgraduates</p>	<p>Demonstrates background theoretical knowledge of physiology.</p> <p>Demonstrates background knowledge on various tests which may be performed for assessing physiological functions</p> <p>Applies the physiological knowledge to understand the pathophysiological basis of disease</p> <p>Teaches undergraduates basic knowledge of physiology Applies advanced knowledge of cellular, and molecular and systemic physiology in critical problem solving. Teaches co postgraduates</p>
MK 2	<p>Fails to Identify and lists the tests which may be used for evaluating physiological functions in different pathological conditions.</p> <p>Fails to describe the basic preparatory requirements for conducting the tests.</p> <p>Fails to describe the indications and contraindications of the tests</p> <p>Fails to demonstrate the procedure of recording various physiological variables</p> <p>Fails to apply the knowledge of physiology for interpreting the findings following evidence-based guidelines with assistance. Fails to identify the experimental, physiological and pathological variations which may affect the test results.</p> <p>Fails to independently interpret the findings of test results distinguishing normal from abnormal findings</p>	<p>Identifies and lists the tests which may be used for evaluating physiological functions in different pathological conditions.</p> <p>Describes the basic preparatory requirements for conducting the tests.</p> <p>Describes the indications and contraindications of the tests</p> <p>Demonstrates the procedure of recording various physiological variables</p> <p>Applies the knowledge of physiology for interpreting the findings following evidence-based guidelines with assistance.</p> <p>Identifies the experimental, physiological and pathological variations which may affect the test results.</p> <p>Independently interprets the findings of test results distinguishing normal from abnormal findings</p>
PC 1	<p>Fails to identify the key elements of a report with respect to the test involved Fails to identify the physiological and pathological variations which may affect various elements of the report with respect to the test involved</p> <p>Un able to produce reports for simple cases with assistance</p> <p>Un able to Independently generates reports for simple cases and identifies complicated cases with assistance</p>	<p>Identifies the key elements of a report with respect to the test involved</p> <p>Identifies the physiological and pathological variations which may affect various elements of the report with respect to the test involved</p> <p>Produces reports for simple cases with assistance Independently generates reports for simple cases and identifies complicated cases with assistance</p>

PC 2	<p>Un able to discuss importance of diagnoses and test results in patient care Fails to identify pertinent test results and correlates to clinical findings to develop a differential diagnosis with assistance. Lack of integrating test results with clinical findings to refine differential and propose a diagnosis with assistance Fails to accurately interprets the test results and makes a differential diagnosis independently for simple cases</p>	<p>Discusses importance of diagnoses and test results in patient care Identifies pertinent test results and correlates to clinical findings to develop a differential diagnosis with assistance. Consistently integrates test results with clinical findings to refine differential and propose a diagnosis with assistance Accurately interprets the test results and makes a differential diagnosis independently for simple cases</p>
SBP1	<p>Fails to discuss the role of the physiologist in laboratory initiatives Fails to demonstrate familiarity with basic technical concepts of hardware, operating systems, databases, and software for general purpose applications Un able to understand laboratory specific software, key technical concepts and interfaces, calibration and standardisation of equipments. Fails to participate in operational and strategy meetings, troubleshooting with information technology staff members</p>	<p>Discusses the role of the physiologist in laboratory initiatives Demonstrates familiarity with basic technical concepts of hardware, operating systems, databases, and software for general purpose applications Understands laboratory specific software, key technical concepts and interfaces, calibration and standardisation of equipments. Participates in operational and strategy meetings, troubleshooting with information technology staff members</p>

EPA 3: Teach effectively the basic physiological mechanisms of human body with reference to their implications in the pathogenesis of diseases and management to undergraduate medical, paramedical and other basic science students

1. Description of the activity: This included a brief rationale and a list of the functions required for the EPA.	Residents should be able to teach effectively the basic physiological mechanisms of human body with reference to their implications in the pathogenesis of diseases and management to undergraduate medical, paramedical and other basic science students
2. Most relevant domains of competence:	MK, P, SBP
3. Competencies within each domain critical to entrustment decisions:	MK 1, MK3, P2, P3, SBP2
Methods of assessment	1. Seminar 2. Micro teaching 3. Pedagogy 4. Periodic written exam (Every 6 months)

Competency	Pre-Entrustable	Entrustable
MK 1	<p>Fails to demonstrate background theoretical knowledge of physiology.</p> <p>Fails to Demonstrates background knowledge on various tests which may be performed for assessing physiological functions</p> <p>Fails to apply the physiological knowledge to understand the pathophysiological basis of disease</p> <p>Fails to teach undergraduates basic knowledge of physiology</p> <p>Fails to apply advanced knowledge of cellular, and molecular and systemic physiology in critical problem solving.</p> <p>Fails to teach co postgraduates.</p>	<p>Demonstrates background theoretical knowledge of physiology.</p> <p>Demonstrates background knowledge on various tests which may be performed for assessing physiological functions</p> <p>Applies the physiological knowledge to understand the pathophysiological basis of disease</p> <p>Teaches undergraduates basic knowledge of physiology</p> <p>Applies advanced knowledge of cellular, and molecular and systemic physiology in critical problem solving teaches co postgraduates.</p>
MK 3	<p>Fails to demonstrate the basic knowledge of pedagogical principles, teaching-learning and assessment tools in micro teaching session</p> <p>Unable to apply the content and pedagogical knowledge while teaching students in classes for paramedical students</p> <p>Unable to teach medical undergraduates using appropriate teaching-learning tool (e.g. blackboard/PPTs) after presentation to the faculty and incorporating the obtained feedback</p> <p>Fails to create teaching-learning lesson plans based on content and pedagogical knowledge. Fails to create assessment item/plan for undergraduate evaluation.</p>	<p>Demonstrates the basic knowledge of pedagogical principles, teaching-learning and assessment tools in micro teaching session</p> <p>Applies the content and pedagogical knowledge while teaching students in classes for paramedical students</p> <p>Teaches medical undergraduates using appropriate teaching-learning tool (e.g. blackboard/PPTs) after presentation to the faculty and incorporating the obtained feedback</p> <p>Creates teaching-learning lesson plans based on content and pedagogical knowledge.</p> <p>Creates assessment item/plan for undergraduate evaluation.</p>

P 2	<p>Lack of consistently demonstrates professional behavior, including dress and timeliness, leave with information</p> <p>Fails to respond promptly to instructions, requests, or reminders to complete tasks and responsibilities</p> <p>Un able to recognize situations that may impact own ability to complete tasks and responsibilities in a timely manner and describes the impact on team with assistance</p> <p>Un able to recognize situations that may impact own ability to complete tasks and responsibilities and takes corrective actions independently</p>	<p>Consistently demonstrates professional behavior, including dress and timeliness, leave with information</p> <p>Responds promptly to instructions, requests, or reminders to complete tasks and responsibilities</p> <p>Recognizes situations that may impact own ability to complete tasks and responsibilities in a timely manner and describes the impact on team with assistance</p> <p>Recognizes situations that may impact own ability to complete tasks and responsibilities and takes corrective actions independently</p>
P 3	<p>Unable to demonstrate compassion, sensitivity, and responsiveness and non-discriminatory behaviour to students in and out of classes, patients, teaching and non-teaching staff.</p> <p>Unable to demonstrate compassionate behaviour in day to day activities even in case of disagreements</p> <p>Fails to take responsibility for own professionalism lapses</p> <p>Un able to recognize the errors in his own professional behaviour and self regulates.</p>	<p>Demonstrates compassion, sensitivity, and responsiveness and non-discriminatory behaviour to students in and out of classes, patients, teaching and non-teaching staff.</p> <p>Demonstrates compassionate behaviour in day to day activities even in case of disagreements</p> <p>Takes responsibility for own professionalism lapses. Recognizes the errors in his own professional behaviour and self regulates.</p>
SBP 2	<p>Un able to identify departmental and/or institutional quality improvement activities</p> <p>Un able to participate in departmental and institutional quality improvement activities</p> <p>Fails to identify errors in case of system misses and failure and engages in scholarly activities of root cause analysis in errors of omission and commission in system failure</p> <p>Unable to conducts analysis of events and offers error prevention strategies (simulated)</p>	<p>Identifies departmental and/or institutional quality improvement activities</p> <p>Participates in departmental and institutional quality improvement activities</p> <p>Identifies errors in case of system misses and failure and engages in scholarly activities of root cause analysis in errors of omission and commission in system failure</p> <p>Conducts analysis of events and offers error prevention strategies (simulated)</p>

EPA 4: Interact with the allied departments and render services in advanced laboratory investigations.	
1. Description of the activity: This included a brief rationale and a list of the functions required for the EPA.	Residents should be able to interact with the allied departments and render services in advanced laboratory investigations.
2. Most relevant domains of competence:	MK, PC, SBP, P, IPC
3. Competencies within each domain critical to entrustment decisions:	MK1, PC 2, SBP 2, P2, IPC 2
Methods of assessment	<ol style="list-style-type: none"> 1. Workplace assessment by Faculty 2. Multisource feedback <ol style="list-style-type: none"> a. Allied departments b. Health care workers –Technicians & lab attenders c. Peers

Competency	Pre-Entrustable	Entrustable
MK 1	<p>Fails to demonstrate background theoretical knowledge of physiology Fails to Demonstrate background knowledge on various tests which may be performed for assessing physiological functions</p> <p>Fails to apply the physiological knowledge to understand the pathophysiological basis of disease</p> <p>Failstoteachundergraduatesbasicknowledgeof physiology</p> <p>Fails to apply advanced knowledge of cellular, and molecular and systemic physiology in critical problem solving. Fails to teach co postgraduates</p>	<p>Demonstrates background theoretical knowledge of physiology. Demonstrates background knowledge on various tests which may be performed for assessing physiological functions</p> <p>Applies the physiological knowledge to understand the pathophysiological basis of disease</p> <p>Teachesundergraduatesbasicknowledge of physiology</p> <p>Applies advanced knowledge of cellular, and molecular and systemic physiology in critical problem solving. Teaches co postgraduates</p>
PC 2	<p>Un able to discuss importance of diagnoses and test results in patient care</p> <p>Fails to identify pertinent test results and correlate to clinical findings to develop a differential diagnosis with assistance.</p> <p>Lack of integrating test results with clinical findings to refine differential and propose a diagnosis with assistance</p> <p>Fails to accurately interprets the test results and makes a differential diagnosis independently for simple cases</p>	<p>Discusses importance of diagnoses and test results in patient care</p> <p>Identifies pertinent test results and correlates to clinical findings to develop a differential diagnosis with assistance.</p> <p>Consistently integrates test results with clinical findings to refine differential and propose a diagnosis with assistance</p> <p>Accurately interprets the test results and makes a differential diagnosis independently for simple cases</p>

SBP2	<p>Un able to identify departmental and/or institutional quality improvement activities</p> <p>Un able to participate in departmental and institutional quality improvement activities</p> <p>Fails to identify errors in case of system misses and failure and engages in scholarly activities of root cause analysis in errors of omission and commission in system failure</p> <p>Unable to conducts analysis of events and offers error prevention strategies (simulated)</p>	<p>Identifies departmental and/or institutional quality improvement activities</p> <p>Participates in departmental and institutional quality improvement activities</p> <p>Identifies errors in case of system misses and failure and engages in scholarly activities of root cause analysis in errors of omission and commission in system failure</p> <p>Conducts analysis of events and offers error prevention strategies (simulated)</p>
P2	<p>Lack of consistently demonstrates professional behaviour, including dress and timeliness, leave with information</p> <p>Fails to respond promptly to instructions, requests, or reminders to complete tasks and responsibilities</p> <p>Un able to recognize situations that may impact own ability to complete tasks and responsibilities in a timely manner and describes the impact on team with assistance</p> <p>Un able to recognize situations that may impact own ability to complete tasks and responsibilities and takes corrective actions independently</p>	<p>Consistently demonstrates professional behaviour, including dress and timeliness, leave with information</p> <p>Responds promptly to instructions, requests, or reminders to complete tasks and responsibilities</p> <p>Recognizes situations that may impact own ability to complete tasks and responsibilities in a timely manner and describes the impact on team with assistance</p> <p>Recognizes situations that may impact own ability to complete tasks and responsibilities and takes corrective actions independently</p>
IPC 1	<p>Un able to use language and nonverbal behaviour to demonstrate respect and establish rapport. Interprets verbal and non-verbal messages of others correctly and takes proper course of action</p> <p>Unable to identify common barriers to effective communication (e.g., language, disability) while accurately communicating own role within the health care system</p> <p>Fails to communicate to the patients/students/colleagues for various requirements while overcoming the barriers to communication under supervision</p> <p>Fails to communicate with others to identify, define and solve problems including making decisions about the best course of action</p>	<p>Uses language and nonverbal behavior to demonstrate respect and establish rapport. Interprets verbal and non-verbal messages of others correctly and takes proper course of action</p> <p>Identifies common barriers to effective communication (e.g., language, disability) while accurately communicating own role within the health care system</p> <p>Communicates to the patients/students/colleagues for various requirements while overcoming the barriers to communication under supervision</p> <p>Communicates with others to identify, define and solve problems including making decisions about the best course of action</p>

EPA 5: Acquire administrative skills to set up concerned department / laboratories for assessing physiological functions.	
1. Description of the activity: This included a brief rationale and a list of the functions required for the EPA.	Residents should acquire administrative skills to set up concerned department / laboratories for assessing physiological functions.
2. Most relevant domains of competence:	MK, SBP, IPC
3. Competencies within each domain critical to entrustment decisions:	MK1, MK2, SBP1, IPC1
Methods of assessment	1. Multisource feedback a. Technicians b. Health care workers c. Peers

Competency	Pre-Entrustable	Entrustable
MK 1	<p>Fails to demonstrate background theoretical knowledge of physiology.</p> <p>Fails to Demonstrate background knowledge on various tests which may be performed for assessing physiological functions</p> <p>Fails to apply the physiological knowledge to understand the pathophysiological basis of disease</p> <p>Fails to teach undergraduates basic knowledge of physiology</p> <p>Fails to apply advanced knowledge of cellular, and molecular and systemic physiology in critical problem solving. Fails to teach co postgraduates</p>	<p>Demonstrates background theoretical knowledge of physiology.</p> <p>Demonstrates background knowledge on various tests which may be performed for assessing physiological functions</p> <p>Applies the physiological knowledge to understand the pathophysiological basis of disease</p> <p>Teaches undergraduates basic knowledge of physiology</p> <p>Applies advanced knowledge of cellular, and molecular and systemic physiology in critical problem solving. Teaches co postgraduates</p>

MK 1	<p>Fails to Identify and lists the tests which may be used for evaluating physiological functions in different pathological conditions. Fails to describe the basic preparatory requirements for conducting the tests. Fails to describe the indications and contraindications of the tests</p> <p>Fails to demonstrate the procedure of recording various physiological variables</p> <p>Fails to apply the knowledge of physiology for interpreting the findings following evidence-based guidelines with assistance. Fails to identify the experimental, physiological and pathological variations which may affect the test results.</p> <p>Fails to independently interpret the findings of test results distinguishing normal from abnormal findings</p>	<p>Identifies and lists the tests which may be used for evaluating physiological functions in different pathological conditions.</p> <p>Describes the basic preparatory requirements for conducting the tests. Describes the indications and contraindications of the tests</p> <p>Demonstrates the procedure of recording various physiological variables</p> <p>Applies the knowledge of physiology for interpreting the findings following evidence-based guidelines with assistance. Identifies the experimental, physiological and pathological variations which may affect the test results.</p> <p>Independently interprets the findings of test results distinguishing normal from abnormal findings</p>
SBP1	<p>Fails to discuss the role of the physiologist in laboratory initiatives</p> <p>Fails to demonstrate familiarity with basic technical concepts of hardware, operating systems, databases, and software for general purpose applications</p> <p>Un able to understand laboratory specific software, key technical concepts and interfaces, calibration and standardisation of equipments.</p> <p>Fails to participate in operational and strategy meetings, troubleshooting with information technology staff members</p>	<p>Discusses the role of the physiologist in laboratory initiatives</p> <p>Demonstrates familiarity with basic technical concepts of hardware, operating systems, databases, and software for general purpose applications</p> <p>Understands laboratory specific software, key technical concepts and interfaces, calibration and standardisation of equipments.</p> <p>Participates in operational and strategy meetings, troubleshooting with information technology staff members</p>

IPC 1	<p>Un able to use language and nonverbal behaviour to demonstrate respect and establish rapport. Interprets verbal and non-verbal messages of others correctly and takes proper course of action</p> <p>Un able to identify common barriers to effective communication (e.g., language, disability) while accurately communicating own role within the health care system</p> <p>Fails to communicate to the patients/students/colleagues for various requirements while overcoming the barriers to communication under supervision Fails to communicate with others to identify, define and solve problems including making decisions about the best course of action</p>	<p>Uses language and nonverbal behaviour to demonstrate respect and establish rapport. Interprets verbal and non-verbal messages of others correctly and takes proper course of action</p> <p>Identifies common barriers to effective communication (e.g., language, disability) while accurately communicating own role within the health care system</p> <p>Communicates to the patients/students/colleagues for various requirements while overcoming the barriers to communication under supervision Communicates with others to identify, define and solve problems including making decisions about the best course of action</p>
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EPA 6: Should be able to serve the community as competent physiologists by imparting physiological understanding of health problems.	
1. Description of the activity: This included a brief rationale and a list of the functions required for the EPA	Residents should be able to serve the community as competent physiologists by imparting physiological understanding of health problems
2. Most relevant domains of competence:	MK, PBL, IPC
3. Competencies within each domain critical to entrustment decisions:	MK1, MK2, PBL 2, IPC1
4. Methods of assessment	<ol style="list-style-type: none"> 1. Periodic written exam (Every 6 months) 2. Workplace assessment by Faculty 3. Multisource feedback <ol style="list-style-type: none"> a. Students b. Health care workers c. Peers

Competency	Pre-Entrustable	Entrustable
MK 1	<p>Fails to demonstrate background theoretical knowledge of physiology.</p> <p>Fails to Demonstrate background knowledge on various tests which may be performed for assessing physiological functions</p> <p>Fails to apply the physiological knowledge to understand the pathophysiological basis of disease</p> <p>Fails to teach undergraduates basic knowledge of physiology</p> <p>Fails to apply advanced knowledge of cellular, and molecular and systemic physiology in critical problem solving.</p> <p>Fails to teach co postgraduates</p>	<p>Demonstrates background theoretical knowledge of physiology.</p> <p>Demonstrates background knowledge on various tests which may be performed for assessing physiological functions</p> <p>Applies the physiological knowledge to understand the pathophysiological basis of disease</p> <p>Teaches undergraduates basic knowledge of physiology</p> <p>Applies advanced knowledge of cellular, and molecular and systemic physiology in critical problem solving. Teaches co postgraduates</p>
MK 2	<p>Fails to Identify and lists the tests which may be used for evaluating physiological functions in different pathological conditions. Fails to describe the basic preparatory requirements for conducting the tests. Fails to describe the indications and contraindications of the tests</p> <p>Fails to demonstrate the procedure of recording various physiological variables</p> <p>Fails to apply the knowledge of physiology for interpreting the findings following evidence-based guidelines with assistance. Fails to identify the experimental, physiological and pathological variations which may affect the test results.</p> <p>Fails to independently interpret the findings of test results distinguishing normal from abnormal findings</p>	<p>Identifies and lists the tests which may be used for evaluating physiological functions in different pathological conditions. Describes the basic preparatory requirements for conducting the tests. Describes the indications and contraindications of the tests</p> <p>Demonstrates the procedure of recording various physiological variables</p> <p>Applies the knowledge of physiology for interpreting the findings following evidence-based guidelines with assistance.</p> <p>Identifies the experimental, physiological and pathological variations which may affect the test results.</p> <p>Independently interprets the findings of test results distinguishing normal from abnormal findings</p>
PBL 2	<p>Fails to use information technology to search and access relevant medical information</p> <p>Fails to interpret the research findings in the light of its basic and applied significance.</p> <p>Fails to evaluate research publications critically. Uses scholarly articles and guidelines to find answers to knowledge gaps</p> <p>Fails to engage in scholarly activity regarding evidence-based medicine while evaluating it critically.</p>	<p>Uses information technology to search and access relevant medical information</p> <p>Interpret the research findings in the light of its basic and applied significance.</p> <p>Evaluates research publications critically. Uses scholarly articles and guidelines to find answers to knowledge gaps</p> <p>Engages in scholarly activity regarding evidence-based medicine while evaluating it critically.</p>

IPC 1	<p>Un able to use language and nonverbal behaviour to demonstrate respect and establish rapport. Interprets verbal and non-verbal messages of others correctly and takes proper course of action</p> <p>Un able to identify common barriers to effective communication (e.g., language, disability) while accurately communicating own role within the health care system</p> <p>Fails to communicate to the patients/students/colleagues for various requirements while overcoming the barriers to communication under supervision</p> <p>Fails to communicate with others to identify, define and solve problems including making decisions about the best course of action</p>	<p>Uses language and nonverbal behavior to demonstrate respect and establish rapport. Interprets verbal and non-verbal messages of others correctly and takes proper course of action</p> <p>Identifies common barriers to effective communication (e.g., language, disability) while accurately communicating own role within the health care system</p> <p>Communicates to the patients/students/colleagues for various requirements while overcoming the barriers to communication under supervision</p> <p>Communicates with others to identify, define and solve problems including making decisions about the best course of action</p>
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EPA 7: Possess necessary knowledge, skills and attitude to carry out biomedical research to enhance knowledge in basic sciences.	
1. Description of the activity: This included a brief rationale and a list of the functions required for the EPA	Residents should be able to possess necessary knowledge, skills and attitude to carry out biomedical research to enhance knowledge in basic sciences.
2. Most relevant domains of competence:	MK, PBL
3. Competencies within each domain critical to entrustment decisions:	MK1, MK2, PBLI 1, PBLI 2
4. Methods of assessment	<ol style="list-style-type: none"> 1. Periodic written exam (Every 6 months) 2. Journal club 3. Dissertation evaluation

Competency	Pre-Entrustable	Entrustable
MK 1	<p>Fails to demonstrate background theoretical knowledge of physiology.</p> <p>Fails to Demonstrate background knowledge on various tests which may be performed for assessing physiological functions</p> <p>Fails to apply the physiological knowledge to understand the pathophysiological basis of disease</p> <p>Fails to teach undergraduates basic knowledge of physiology</p> <p>Fails to apply advanced knowledge of cellular, and molecular and systemic physiology in critical problem solving.</p> <p>Fails to teach co postgraduates</p>	<p>Demonstrates background theoretical knowledge of physiology.</p> <p>Demonstrates background knowledge on various tests which may be performed for assessing physiological functions</p> <p>Applies the physiological knowledge to understand the pathophysiological basis of disease</p> <p>Teaches undergraduates basic knowledge of physiology</p> <p>Applies advanced knowledge of cellular, and molecular and systemic physiology in critical problem solving. Teaches co postgraduates</p>
MK 2	<p>Fails to Identify and lists the tests which may be used for evaluating physiological functions in different pathological conditions. Fails to describe the basic preparatory requirements for conducting the tests. Fails to describe the indications and contraindications of the tests</p> <p>Fails to demonstrate the procedure of recording various physiological variables</p> <p>Fails to apply the knowledge of physiology for interpreting the findings following evidence-based guidelines with assistance. Fails to identify the experimental, physiological and pathological variations which may affect the test results.</p> <p>Fails to independently interpret the findings of test results distinguishing normal from abnormal findings</p>	<p>Identifies and lists the tests which may be used for evaluating physiological functions in different pathological conditions.</p> <p>Describes the basic preparatory requirements for conducting the tests. Describes the indications and contraindications of the tests</p> <p>Demonstrates the procedure of recording various physiological variables</p> <p>Applies the knowledge of physiology for interpreting the findings following evidence-based guidelines with assistance. Identifies the experimental, physiological and pathological variations which may affect the test results.</p> <p>Independently interprets the findings of test results distinguishing normal from abnormal findings</p>
PBL 1	<p>Fails to acknowledge gaps in own knowledge and expertise in physiology</p> <p>Fails to incorporate feedback for improving knowledge and skill gap</p> <p>Fails to develop a learning plan based on the knowledge and expertise gap and the obtained feedback.</p> <p>Un able implement the learning plan successfully to bridge the gap.</p>	<p>Acknowledges gaps in own knowledge and expertise in physiology</p> <p>Incorporates feedback for improving knowledge and skill gap</p> <p>Develops a learning plan based on the knowledge and expertise gap and the obtained feedback.</p> <p>Implements the learning plan successfully to bridge the gap.</p>

PBL 2	<p>Fails to use information technology to search and access relevant medical information</p> <p>Fails to interpret the research findings in the light of its basic and applied significance.</p> <p>Fails to evaluate research publications critically. Uses scholarly articles and guidelines to find answers to knowledge gaps</p> <p>Fails to engage in scholarly activity regarding evidence-based medicine while evaluating it critically.</p>	<p>Uses information technology to search and access relevant medical information</p> <p>Interpret the research findings in the light of its basic and applied significance.</p> <p>Evaluates research publications critically. Uses scholarly articles and guidelines to find answers to knowledge gaps</p> <p>Engages in scholarly activity regarding evidence-based medicine while evaluating it critically.</p>
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EPA 8: Apply the principles of professionalism and ethics in rendering the service	
1. Description of the activity: This included a brief rationale and a list of the functions required for the EPA	Residents should be able to apply the principles of professionalism and ethics in rendering the service
2. Most relevant domains of competence:	MK, P, PBL, SBP
3. Competencies within each domain critical to entrustment decisions:	MK1, P1, P2, P3, PBLI 1, SBP 2
4. Methods of assessment	<ol style="list-style-type: none"> 1. Workplace assessment by Faculty 2. Multisource feedback <ol style="list-style-type: none"> a. Patient/ Subject b. Technicians c. Health care workers d. Peers

Competency	Pre-Entrustable	Entrustable
MK 1	<p>Fails to demonstrate background theoretical knowledge of physiology.</p> <p>Fails to Demonstrates background knowledge on various tests which may be performed for assessing physiological functions</p> <p>Fails to apply the physiological knowledge to understand the pathophysiological basis of disease</p> <p>Fails to teach undergraduates basic knowledge of physiology</p> <p>Fails to apply advanced knowledge of cellular, and molecular and systemic physiology in critical problem solving. Fails to teach co postgraduates</p>	<p>Demonstrates background theoretical knowledge of physiology.</p> <p>Demonstrates background knowledge on various tests which may be performed for assessing physiological functions</p> <p>Applies the physiological knowledge to understand the pathophysiological basis of disease</p> <p>Teaches undergraduates basic knowledge of physiology</p> <p>Applies advanced knowledge of cellular, and molecular and systemic physiology in critical problem solving. Teaches co postgraduates</p>
PI	<p>Fails to demonstrate knowledge of the ethical principles.</p> <p>Fails to demonstrate insight into ethical behaviour in routine situations</p> <p>Fails to demonstrate ethical professional behavior in complex or stressful situations</p> <p>Fails to recognize the errors in his ethical behaviour and self regulates.</p>	<p>Demonstrates knowledge of the ethical principles.</p> <p>Demonstrates insight into ethical behaviour in routine situations</p> <p>Demonstrates ethical professional behavior in complex or stressful situations</p> <p>Recognizes the errors in his ethical behaviour and self regulates</p>
P 2	<p>Lack of consistently demonstrates professional behaviour, including dress and timeliness, leave with information</p> <p>Fails to respond promptly to instructions, requests, or reminders to complete tasks and responsibilities</p> <p>Un able to recognize situations that may impact own ability to complete tasks and responsibilities in a timely manner and describes the impact on team with assistance</p> <p>Un able to recognize situations that may impact own ability to complete tasks and responsibilities and takes corrective actions independently</p>	<p>Consistently demonstrates professional behaviour, including dress and timeliness, leave with information</p> <p>Responds promptly to instructions, requests, or reminders to complete tasks and responsibilities</p> <p>Recognizes situations that may impact own ability to complete tasks and responsibilities in a timely manner and describes the impact on team with assistance</p> <p>Recognizes situations that may impact own ability to complete tasks and responsibilities and takes corrective actions independently</p>

P 3	<p>Unable to demonstrate compassion, sensitivity, and responsiveness and non-discriminatory behaviour to students in and out of classes, patients, teaching and non-teaching staff.</p> <p>Unable to demonstrate compassionate behaviour in day to day activities even in case of disagreements</p> <p>Fails to take responsibility for own professionalism lapses</p> <p>Un able to recognize the errors in his own professional behaviour and self regulates.</p>	<p>Demonstrates compassion, sensitivity, and responsiveness and non-discriminatory behaviour to students in and out of classes, patients, teaching and non-teaching staff.</p> <p>Demonstrates compassionate behaviour in day to day activities even in case of disagreements</p> <p>Takes responsibility for own professionalism lapses.</p> <p>Recognizes the errors in his own professional behaviour and self regulates.</p>
PBL 1	<p>Fails to acknowledge gaps in own knowledge and expertise in physiology</p> <p>Fails to incorporate feedback for improving knowledge and skill gap</p> <p>Fails to develop a learning plan based on the knowledge and expertise gap and the obtained feedback.</p> <p>Unable to implement the learning plan successfully to bridge the gap.</p>	<p>Acknowledges gaps in own knowledge and expertise in physiology</p> <p>Incorporates feedback for improving knowledge and skill gap</p> <p>Develops a learning plan based on the knowledge and expertise gap and the obtained feedback.</p> <p>Implements the learning plan successfully to bridge the gap.</p>
SBP 2	<p>Un able to identify departmental and/or institutional quality improvement activities</p> <p>Un able to participate in departmental and institutional quality improvement activities</p> <p>Fails to identify errors in case of system misses and failure and engages in scholarly activities of root cause analysis in errors of omission and commission in system failure</p> <p>Unable to conducts analysis of events and offers error prevention strategies (simulated)</p>	<p>Identifies departmental and/or institutional quality improvement activities</p> <p>Participates in departmental and institutional quality improvement activities</p> <p>Identifies errors in case of system misses and failure and engages in scholarly activities of root cause analysis in errors of omission and commission in system failure</p> <p>Conducts analysis of events and offers error prevention strategies (simulated)</p>

Table 5.Mapping of PO, EPA, Competency and Sub-competency with level

EPA		Program Objective						Domains and levels of competency
		1	2	3	4	5	6	
1	Evaluate physiological functions in patients	Y	Y					MK1, MK2,P1,P3 SBP1
2	Generate patient reports for assessment of physiological functions			Y				MK1, MK2, PC1, PC2, P2, SBP 1
3	Teach effectively the basic physiological mechanisms of human body with reference to their implications in the pathogenesis of diseases and management to undergraduate medical, paramedical and other basic science students	Y						MK1, MK3, P2, P3, SBP 2
4	Interact with the allied departments and render services in advanced laboratory investigations			Y				MK1, PC 2, SBP 2, P2, IPC 2
5	Acquire administrative skills to set up concerned department / laboratories for assessing physiological functions.			Y	Y			MK1, MK2, SBP1, IPC1
6	Should be able to serve the community as competent physiologists by imparting physiological understanding of health problems.		Y					MK1, MK2, PBL 2, IPC1
7	Possess necessary knowledge, skills and attitude to carry out biomedical research to enhance knowledge in basic sciences					Y		MK1, MK2, PBLI 1, PBLI 2
8	Apply the principles of professionalism and ethics in rendering the service						Y	MK1, P1, P2, P3, PBLI 1, SBP 2

- As a part the Internal Assessment should be conducted in theory and clinical examination every 6 months
- Quarterly assessment during the MD training should be based on following educational activities:
 1. Journal based / recent advances learning
 2. Patient based / Laboratory or Skill based learning
 3. Self-directed learning and teaching
 4. Departmental and interdepartmental learning activity
 5. External and Outreach Activities / CMEs

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure-2).

8.2. Summative Assessment

Eligibility for appearing in the final university exam

- Attendance : 75 % each year
- One poster presentation in International/National/ State level conference.
- One oral presentation in International/National/ State level conference.
- Submission of one scientific paper for publication to an indexed journal

8.2.1. Postgraduate Examination shall be in three parts

1. Dissertation

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a dissertation. Work for writing the dissertation is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature. Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination and will be evaluated by two externals. A postgraduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. Theory Examination:

There should be four theory papers, as given below:

Paper I: General Physiology including history of Physiology

Paper II: Systemic Physiology (system providing transport, nutrition and energy)

Paper III: Systemic Physiology (system concerned with regulation, neural control and procreation)

Paper IV: Applied Physiology including recent advances

Each theory paper will be of 100 marks (Total 400). Each paper will have 10 short essay answer questions of 10 marks each.

Practical, Oral/viva voce Examination including Dissertation and Spotters: shall be as given below:

Practical examination should be spread over two days and include the following components:

1. Objective Structured Practical Exam (OSPE)/ Spotting
2. Problem solving exercises pertaining to Clinical Physiology
3. Performing and reporting two special laboratory investigations
4. Two animal experiments (one long and one short) illustrating mechanisms, physiological concepts and their applications to humans. (Subject to current regulation of Government of India regarding animal usage). This is optional. It is advisable to use simulated experiments for this purpose.
5. Two human experiments (one long and one short), dealing with clinical physiology as would have significant bearing on human health and patient care.
6. Micro-teaching session for assessing communication skills.

Viva-voce examination should include the following components:

- (i) Theoretical discussion (General and systemic Physiology)
- (ii) Teaching techniques
- (iii) Thesis
- (iv) Eminent Physiologists (Foreign/Indian)

(v) Journals (Indian/Foreign)

(vi) Recent advances

MARK WEIGHTAGE

Scheme of Examination for practical (Total 200 marks)

Day 1

1) Human Experiment 50 marks

2) Clinical Examination 50 marks

3) Haematology 50 marks

Day 2

4) Mammalian (Isolated)* 15 marks

5) Mammalian (Intact)* 15 marks

6) Amphibian* 20 marks

*Interpretation of pre-recorded graphs * USE OF ALTERNATIVES

VIVA VOCE: (100 marks)

The division of Marks:

Dissertation Viva 20 marks

Subject Viva 60 marks

Pedagogy 20 marks

Pass criteria: The examination (MD) shall be held at the end of 3rd academic year. There will be four evaluations for each theory paper. The examinations shall be organised on the basis of 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. Student must secure minimum of 40% in each theory paper and in aggregate 50% overall as far as theory is concerned.

9. Blueprint of Weightage of System

9.1 Paper I: General and Cellular Physiology including Genetic Basis and Historical perspectives

Sl.NO	Discipline	Topics	Weightage	Marks Allotted	No. of Question
1	General physiology	Physiology of cell, various cellular mechanisms and genetic control mechanisms	20%	20	2
2	Body fluids and biophysics	Various principles of Physics and Physical Chemistry involved in physiological phenomenon e.g. haemodynamics, bio-electrical potentials, body fluids, methods of measurements	20%	20	2
3	History of Physiology	Historical perspective in physiology	10%	10	1
4	Biostatistics	Basics of research methodology and analysis	10%	10	1
5	Growth and development	Growth and development including aging	10%	10	1
6	Excretion and Electrolyte balance.	Excretion, pH, water and Electrolyte balance.	20%	20	2
7	Biochemistry, Micro-anatomy	Biochemistry: All clinical biochemical test and basis of operation of various equipment's and interpretation of data Micro-anatomy: Study of human body at various level particularly head, neck, thorax and abdomen	10%	10	1

9.2. Paper II Systemic Physiology (system providing transport, nutrition and energy) including comparative Physiology

Sl.NO	Discipline	Topics	Weightage	Marks Allotted	No. of Question
1	Blood	Plasma and plasma proteins, Red blood cell and anaemia, White blood cell, Platelet, Hemostasis and Blood coagulation, Blood group and transfusion	20%	20	2
2	Immunity	Immune system and mechanism	10%	10	1
3	Cardiovascular System	Functional anatomy and Physiology of heart, Electrocardiogram, Cardiac cycle, Cardiac output, Cardiovascular regulation and Circulation	20%	10	2
4	Respiratory System	Functional anatomy and physiology of respiratory system. Pulmonary ventilation, Circulation and Diffusion. Transport of gases and regulation	20%	20	2
5	Gastrointestinal Tract	Functional anatomy and physiology of GIT, physiological activity in mouth, pharynx, oesophagus and stomach. Pancreas, liver and gall bladder, physiological activity in small intestine and large intestine, Digestion, absorption and dietary requirements	30%	30	3

9.3 Paper III: Systemic Physiology (system concerned with procreation, regulation and neural control)

Sl.NO	Discipline	Topics	Weightage	Marks Allotted	No. of Question
1	Nerve-Muscle Physiology	Nerve, neuromuscular junction, skeletal muscle, smooth muscle and cardiac muscle	10%	10	1
2	Endocrine Physiology	General principles, endocrinal functions of hypothalamus, pituitary, thyroid, adrenal gland, pancreas. Calcium metabolism, bone physiology and local hormones	30%	30	3
3	Nervous System	Central, peripheral and autonomic nervous system	40%	40	4
4	Special Senses	Sense of vision, hearing and chemical sense	10%	10	1

5	Reproduction & family planning	Sexual growth and development, male and female reproductive physiology, physiology of coitus, pregnancy, parturition, lactation and contraception	10%	10	1
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9.4. Paper-IV: Applied Physiology including recent advances

Sl.No	Discipline	Topics	Weightage	Marks Allotted	No. of Question
1	Patho-physiology	Patho-physiology pertaining to systemic Physiology	30%	30	3
2	Physiological basis of various clinical investigation	Electromyography, nerve conduction study, autonomic function test, heart rate variability, evoked potential	20%	20	2
3	Interaction of human body in ambient environment	high altitude, space and deep sea	10%	10	1
4	Sports physiology	Exercise: types and grading, adjustments to exercise Cardiovascular and respiratory response to exercise Changes at the tissue level, Endocrinal responses to exercise	10%	10	1
5	Yoga and Meditation	Physiological basis of using yoga as adjuvant therapy for pathological condition and life style modification	10%	10	1
6	Recent advances relevant to Physiology	New Diagnostic and therapeutic technique relevant to physiology	10%	10	1
7	Social responsibilities of physiologist	Role and responsibilities of physiologist	10%	10	1

10. Model question Paper

10.1. Paper I General and Cellular Physiology including Genetic Basis and Historical perspectives

Answer all questions

Duration : Three hours

Draw diagram whenever necessary

Maximum marks: 100

Time : 3 hrs

(10 x 10 = 100)

1. Explain the role of G proteins in cell signalling
2. Briefly explain the functions of cellular lipids.
3. Explain in detail how hyperosmolarity is produced and maintained in renal medulla
4. Briefly explain the genesis of membrane potential
5. Name the buffer systems in human body. Explain the role of kidney in maintaining body pH.
6. Describe blood flow and pressure gradient relationship
7. What is a descriptive study? Briefly describe its types and advantages.
8. What is aging? Describe the physiological effects of aging.
9. Describe post translation modification
10. Briefly describe the role of Nobel laureates in the development of physiology.

10.2. Paper II Systemic Physiology (system providing transport, nutrition and energy) including comparative Physiology

Answer all questions

Duration : Three hours

Draw diagram whenever necessary

Maximum marks: 100

Time : 3 hrs

(10 x 10 = 100)

1. Give details of the role of platelets in hemostasis.
2. Explain in detail the type, production and functions of tissue macrophages.
3. Classify anemia based on blood indices. Describe their characteristics features and physiological basis of treatment.
4. Draw a diagram showing correlation between ECG, left ventricular pressure changes and heart sounds. Briefly explain the electrophysiological basis of ECG waves.
5. Give a brief description of cardiovascular effects of reflexes arising from atria and ventricles.
6. Classify pulmonary function tests. Describe the measurement of anatomical dead space. Give the significance of physiological dead space.
7. Explain the status of arterial oxygen tension and content in different types of hypoxia. What is the place of oxygen therapy in hypoxia.
8. Describe the mechanism and regulation of HCl secretion in stomach.
9. Outline the composition, regulation of secretion and functions of pancreatic juice.
10. Describe the factors regulating gastric emptying

10.3. Paper III: Systemic Physiology (system concerned with procreation, regulation and neural control)

Answer all questions

Duration : Three hours

Draw diagram whenever necessary

Maximum marks: 100

Time : 3 hrs

(10 x 10 = 100)

1. What are the consequences of nerve section? Describe the process of nerve regeneration.
2. Describe various mechanisms by which hormones exert their effect through membrane receptors.
3. Explain the role of hormones in maintaining calcium homeostasis.
4. Name the catecholamines. List their sources and explain their mechanism of action.
5. Define fatigue. Briefly describe the factors that influence its onset. Give experimental evidence to demonstrate the site of fatigue.
6. With the help of schematic diagram(s), explain the static and dynamic responses of afferent fibers to stretch.
7. Discuss the various mechanisms of regulation of posture and movement.
8. What is conditioning, learning and memory? Explain the mechanisms of short term and long term memory.
9. Discuss the various theories of colour vision. With the help of a diagram explain the effect of lesion at various parts of visual pathway.
10. Describe the factors affecting various stages of spermatogenesis.

10.4. Paper-IV: Applied Physiology including recent advances

Answer all questions

Duration: Three hours

Draw diagram whenever necessary

Maximum marks: 100

Time : 3 hrs

(10 x 10 = 100)

1. Describe the ventricular performance during heart failure. Give the physiological principles of treating heart failure.
2. Describe the role of chemoreceptors in regulation of respiration. How does alkalosis modulate ventilator response to hypoxia?
3. Give the value of normal coronary blood flow during rest and exercise. Describe the various factors that determine coronary blood flow during moderate exercise.
4. Briefly describe gastric mucosal barrier and role of yoga in treatment of gastric ulcer
5. Describe the physiological responses to exposure to hot and humid environment.
6. Briefly describe in-vitro fertilization.
7. Briefly describe Intra operative neuromonitoring
8. Explain the various mechanisms of immunological tolerance
9. Describe electromyography
10. Describe Physiologist social responsibilities

11. Recommended Reading

11.1 Books

1. A.C. Guyton – Text book of Medical Physiology
2. W.F. Ganong – Review of Medical Physiology
3. Vernon B. Mountcastle– Medical Physiology Vol. I & II
4. William’s Textbook of Endocrinology
5. J.E. Cotes- Respiratory Physiology
6. D.T. Harris – Experimental Physiology
7. Wintrobe’s – Clinical Haematology
8. Brown B.L. – Cell signalling, Biology and medicine of signal transduction
9. Berne and Levy- Medical Physiology
10. Textbook of Medicine by Harrison
11. API Textbook of Medicine

11.2 Journals

1. Physiological Reviews.
2. Indian Journal of Physiology and Pharmacology.
3. American Journal of Physiology.
4. The New England Journal of Medicine.
5. Trends in Neuroscience.

12. Annexures

Annexure-1: Entrustable Professional Activities Assessment

Department Of Physiology, Mahatma Gandhi Medical College and Research Institute

Entrustable Professional Activities Assessment Form MD Physiology Residents

Name of the Resident:

UNI No:

Levels of competence:

- ❖ Level I: Knowledge only; can observe
- ❖ Level II(A): Can assist properly
- ❖ Level II(B): Can do under strict supervision
- ❖ Level III: Can do under loose supervision (Entrustability decision to be made based on milestones)
- ❖ Level IV: Can do independently
- ❖ Level V: Has expertise to teach others

First year of the residency

EPAs	On the day joining	After 1 month	1st Quarter		2nd Quarter	
	Resident	Residen	Faculty	Resident	Faculty	Resident
1	Evaluate physiological functions in patients					
2	Generate patient reports for assessment of physiological functions					
3	Teach effectively the basic physiological mechanisms of human body with reference to their implications in the pathogenesis of diseases and management to undergraduate medical, paramedical and other basic science students					
4	Interact with the allied departments and render services in advanced laboratory investigations.					
5	Acquire administrative skills to set up concerned department / laboratories for assessing physiological functions					
6	Should be able to serve the community as competent physiologists by imparting physiological understanding of health problems.					
7	Possess necessary knowledge, skills and attitude to carry out biomedical research to enhance knowledge in basic sciences.					
8	Apply the principles of professionalism and ethics in rendering the service					
9	Signature of the faculty					
10	Signature of the HOD					

Second year of the residency

Sl. NO	EPA	5th Hf yr		6th Hf yr	
		Resident	Faculty	Resident	Faculty
1	Evaluate physiological functions in patients				
2	Generate patient reports for assessment of physiological functions				
3	Teach effectively the basic physiological mechanisms of human body with reference to their implications in the pathogenesis of diseases and management to undergraduate medical, paramedical and other basic science students				
4	Interact with the allied departments and render services in advanced laboratory investigations.				
5	Acquire administrative skills to set up concerned department / laboratories for assessing physiological functions				
6	Should be able to serve the community as competent physiologists by imparting physiological understanding of health problems				
7	Possess necessary knowledge, skills and attitude to carry out biomedical research to enhance knowledge in basic sciences				
8	Apply the principles of professionalism and ethics in rendering the service				
Signature of the resident					
Signature faculty					
Signature of the HOD					

Third year of the residency

Sl. NO	EPA	7th Hf yr		8th Hf yr	
		Resident	Faculty	Resident	Faculty
1	Evaluate physiological functions in patients				
2	Generate patient reports for assessment of physiological functions				
3	Teach effectively the basic physiological mechanisms of human body with reference to their implications in the pathogenesis of diseases and management to undergraduate medical, paramedical and other basic science students				
4	Interact with the allied departments and render services in advanced laboratory investigations.				
5	Acquire administrative skills to set up concerned department / laboratories for assessing physiological functions.				
6	Should be able to serve the community as competent physiologists by imparting physiological understanding of health problems.				
7	Possess necessary knowledge, skills and attitude to carry out biomedical research to enhance knowledge in basic sciences.				
8	Apply the principles of professionalism and ethics in rendering the service				
Signature of the resident					
Signature faculty					
Signature of the HOD					

Annexure 2: Quarterly Appraisal Form

SRI BALAJI VIDYAPEETH

**Department of Physiology
Postgraduate Students Appraisal Form**

Name of the PG Student:

UNI No:

Period of Training: FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		123	456	789	
1	Journalbased/recentadvanceslearning				
2	Patientbased/LaboratoryorSkillbased learning				
3	Self directed learning and teaching				
4	Departmental and interdepartmental learning activity				
5	External and Outreach Activities / CMEs				
6	Thesis / Research work				
7	E-portfolio Maintenance				

Publications

Yes/ No

Remarks* _____

*REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

Signature of the faculty

Signature of HOD

Annexure 3: Multisource feedback
SRI BALAJI VIDYAPEETH

Department of Physiology
EVALUATION SHEET FOR POSTGRADUATE WORK
(To be completed by subject/Patient)

Name of the PG Student: UNI No:

Name of the Respondent: Date:

Period of Training: FROM..... TO.....

Sr. No.	Criteria to be assessed	Score		
		Below par (1)	At par (2)	Above par (3)
1	Shows a caring attitude to subject/patients			
2	Is respectful towards subject/ patients			
3	Shows no prejudice in the care of subject/patients			
4	Communicates effectively with subject/ patients			
5	Counseling of subject/ patient's relatives			
6	Takes religious and social considerations into account when making decisions			
7	Allows subject/patients to make an informed decision regarding management and allows them to express their doubts and concerns			
8	Takes financial situation of subject/patient into consideration when making decisions			
9	Discusses each step of the management with the subject/patient and relatives			
		Total score:		
	General Comments:			
	Highlights in performance (strengths)			
	Possible suggested areas for improvement (weakness)			
	Signature of the faculty:			

ii. Peer

SRI BALAJI VIDYAPEETH

Department of Physiology

EVALUATION SHEET FOR POSTGRADUATE WORK

(To be completed by Peer)

Name of the PG Student:

UNI No:

Name of the Respondent:

Date:

Sr. No.	Criteria to be assessed	Score		
		Below par (1)	At par (2)	Above par (3)
1	Shows a caring attitude to subject/patients			
2	Is respectful towards subject/ patients			
3	Shows no prejudice in the care of subject/patients			
4	Communicates and counsels effectively subject/patients and patient's relatives			
5	Critically evaluates and uses subject/patient outcomes to improve subject/patient care			
6	Communicates effectively with colleagues			
7	Communicates effectively with other health professionals			
8	Acknowledges gaps in personal knowledge and expertise, and frequently asks for feedback			
9	Regularity and punctuality of attendance			
10	Works constructively in the health care system			
		Total score:		
	General Comments:			
	Highlights in performance (strengths)			
	Possible suggested areas for improvement (weakness)			
	Signature of the faculty:			

iii. Technician / Other Health Professionals

SRI BALAJI VIDYAPEETH

EVALUATION SHEET FOR POSTGRADUATEWORK

(To be completed by Technician / Other Health Professionals)

Name of the Resident:

UIN No.:

Name of the Respondent:

Date:

Sl. No.	Criteria to be assessed	Score		
		Below par (1)	At par (2)	Above par (3)
1	Shows a caring attitude to subject/patients			
2	Is respectful towards subject/patients			
3	Shows no prejudice in the care of subject/patients			
4	Communicates effectively with subject/patients			
5	Empathetic counselling of subject/patient's			
6	Communicates effectively with colleagues			
7	Communicates effectively with other health professionals			
8	Allows them to express their doubts or concern regarding decisions			
9	Proper and complete documentation			
10	Works constructively in the health care system			
		Total score:		
	General Comments:			
	Highlights in performance (strengths)			
	Possible suggested areas for improvement (weakness)			
Signature of the faculty:				

iv. Head of Department
SRI BALAJI VIDYAPEETH

EVALUATION SHEET FOR POSTGRADUATE WORK

(To be completed by Technician / Other Health Professionals)

Name of the Resident:

UIN No.:

Name of the Faculty:

Date:

Sl. No.	Criteria to be assessed	Score		
		Below par (1)	At par (2)	Above par (3)
1	Teaching			
2	Regularity and punctuality			
3	Ability to identify problems			
4	Management skills			
5	Procedural skills / range of clinical technical skills			
6	Self directed learning			
7	Communication skills			
8	Proper and complete documentation			
9	Relationship with peers			
10	Works constructively in the health care system			
		Total score:		
	General Comments:			
	Highlights in performance (strengths)			
	Possible suggested areas for improvement (weakness)			
Signature of the faculty:				

Annexure 4: Work Place Based Assessment (WPBA)

SRI BALAJI VIDYAPEETH

Department of Physiology

EVALUATION SHEET FOR POSTGRADUATE WORK

Name of the Resident: UIN No.:

Name of the Faculty: Date:

Designation :.....

	Below expectation	Borderline	Meet expectation	Above expectation	Not observed
History taking skill					
Physical examination skill					
Communication skill					
Clinical judgement					
Professionalism					
Organisational efficiency					
Overall clinical care					

Anything good:	Suggestions for improvement:
Agreed upon action:	
Signature of the resident	Signature of the faculty

Annexure 5: Feedback for Journal club

SRI BALAJI VIDYAPEETH

Department of Physiology

EVALUATION SHEET FOR POSTGRADUATE JOURNAL CLUB

(To be marked individually by each faculty)

Name of the Resident:

UIN No.:

Name of the Faculty:

Date:

Sl. No.	Criteria to be assessed	Score		
		Below par (1)	At par (2)	Above par (3)
1	Relevance of article chosen			
2	Identifies the problem addressed in the paper			
3	Completeness of presentation			
4	Analyses and gives comments on methodology and statistics			
5	Brief summary of results			
6	Comparison of work with other published work			
7	Merits and demerits of the paper			
8	Summary and take-home message			
9	Time management			
10	Overall performance – relevant answers to questions, attitude during presentation and confidence			
		Total score:		
	General Comments:			
	Highlights in performance (strengths)			
	Possible suggested areas for improvement (weakness)			
	Signature of the faculty:			

Annexure 6: Feedback for Seminar

SRI BALAJI VIDYAPEETH

Department of Physiology

EVALUATION SHEET FOR POSTGRADUATE JOURNAL CLUB

(To be marked individually by each faculty)

Name of the Resident:

UIN No.:

Name of the Faculty:

Date:

Sl. No.	Criteria to be assessed	Score		
		Below par (1)	At par (2)	Above par (3)
1	Introduction of subject and its importance / Objectives			
2	Completeness of presentation			
3	Cogency of presentation			
4	Consulted all relevant literature			
5	Use of audio-visual aids			
6	Understanding of subject			
7	Summary and take home message			
8	Cites appropriate references / suggests further reading			
9	Time management			
10	Overall performance – relevant answers to questions, attitude during presentation and confidence			
		Total score:		
	General Comments:			
	Highlights in performance (strengths)			
	Possible suggested areas for improvement (weakness)			
	Signature of the faculty:			

Annexure 7: Feedback for Case presentation

SRI BALAJI VIDYAPEETH

Department of Physiology

EVALUATION SHEET FOR POSTGRADUATE CASE PRESENTATION

(To be marked individually by each faculty)

Name of the Resident:

UIN No.:

Name of the Faculty:

Date:

Sl. No.	Criteria to be assessed	Score		
		Below par (1)	At par (2)	Above par (3)
1	Logical order in presentation (History taking)			
2	Cogency of presentation			
3	Accuracy and completeness of general and local physical examination			
4	Other systemic examination			
5	Summarizes the case and analyses the appropriate differential diagnoses			
6	Whether the diagnosis follows logically from history and findings			
7	Investigations required :Completeness of list, relevant order, interpretation of investigations			
8	Management principles and details			
9	Time management			
10	Overall performance – relevant answers to questions, attitude during presentation and confidence			
		Total score:		
	General Comments:			
	Highlights in performance (strengths)			
	Possible suggested areas for improvement (weakness)			
Signature of the faculty:				

