



RMU – 12

Integrated Modular

MBBS Curriculum 2026

Isolation to **Beyond Boundaries**

Study Guide

Cardiovascular System

Department of Medical Education

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First Year MBBS

	Rawalpindi Medical University			
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SECTION – I

RMU – 12 Integrated Modular MBBS Curriculum 2026

Isolation to *Beyond Boundaries*

Preamble

Medical education is undergoing a fundamental transformation globally, shifting from discipline-based, fragmented teaching toward integrated, competency-based, and clinically oriented learning systems that prepare graduates for real-world healthcare practice. In response to these evolving educational paradigms, national regulatory expectations, and the healthcare needs of society, Rawalpindi Medical University has adopted Clinically Oriented Integrated Modular RMU 12 MBBS Curriculum the envisioned under the guiding philosophy of “Isolation to Beyond Boundaries.”. This curriculum represents a structured, longitudinal, and outcome-driven educational continuum, progressing from foundational sciences to advanced clinical practice with a fully embedded internship. It is designed to ensure the gradual and coherent development of knowledge, clinical skills, professional attitudes, and Entrustable Professional Activities (EPAs), enabling graduates to emerge as practice-ready, safe, and competent medical professionals.

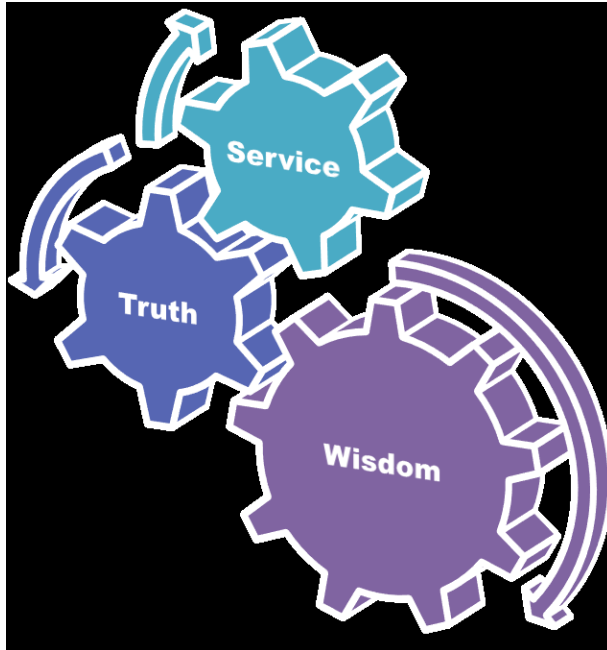
The Clinically Oriented Integrated Modular Curriculum transcends traditional disciplinary silos by promoting horizontal and vertical integration across basic, para-clinical, and clinical sciences. Learning experiences are contextualized around clinical problems and patient-centered care, fostering early clinical exposure, spiral learning, and progressive responsibility. This approach aligns with contemporary integration models, workplace-based assessment strategies, and competency-based medical education principles.

Anchored in national standards and international best practices, the curriculum ensures alignment with PM&DC, WFME and HEC requirements, while addressing local healthcare priorities. By embedding internship within the undergraduate framework and mapping outcomes to clearly defined competencies and Entrustable professional activities (EPAs), the curriculum ensures continuity, accountability, and seamless transition from undergraduate training to independent clinical practice.

Through this clinically oriented and integrated approach, Rawalpindi Medical University aims to produce graduates who are not only clinically proficient but also ethical, reflective, socially accountable, and equipped for lifelong learning moving decisively from isolated learning to integrated, boundary-transcending medical education.

University Moto, Vision, Values & Goals

RMU – 12



Vision and Values

Highly recognized and accredited center of excellence in Medical Education, using evidence-based training techniques for the development of highly competent health professionals, practice-ready for contemporary healthcare, who are critical thinkers, experiential self-directed lifelong learners, and socially accountable.

Mission Statement

To deliver evidence-based, research oriented, and clinically integrated health professional education that produces practice-ready graduates capable of providing safe, effective, patient-centered care, while upholding the values of mutual respect, ethical medical practice, professionalism, and social accountability.

Goals of the Undergraduate Integrated Modular Curriculum

The RMU-12 Model transforms medical education from isolated knowledge acquisition to embedded clinical practice, producing competent, ethical, and practice-ready physicians.

The RMU-12 Undergraduate Medical Program is designed to:

- Provide thorough grounding in the basic theoretical concepts underpinning the practice of medicine.
- Develop and polish the skills required for providing medical services at all levels of the Health care delivery system.
- Help you attain and maintain the highest possible levels of ethical and professional conduct in your future life.
- Kindle a spirit of inquiry and acquisition of knowledge to help you attain personal and professional growth & excellence.

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RMU – 12 Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries

Competency Framework

Competency

PMDC



References

Harden RM. The integration ladder: a tool for curriculum planning and evaluation. Medical education. 2000 Jul 1;34(7).

Ten Cate O. Nuts and bolts of entrustable professional activities. Journal of graduate medical education. 2013 Mar 1;5(1):157-8.

Pakistan Medical & Dental Council Guidelines for Undergraduate Medical Education (MBBS) Curriculum – 2024

Figure 1

RMU – 12 Structured Framework of Integrated Modular MBBS Curriculum 2026 Isolation to Beyond Boundaries

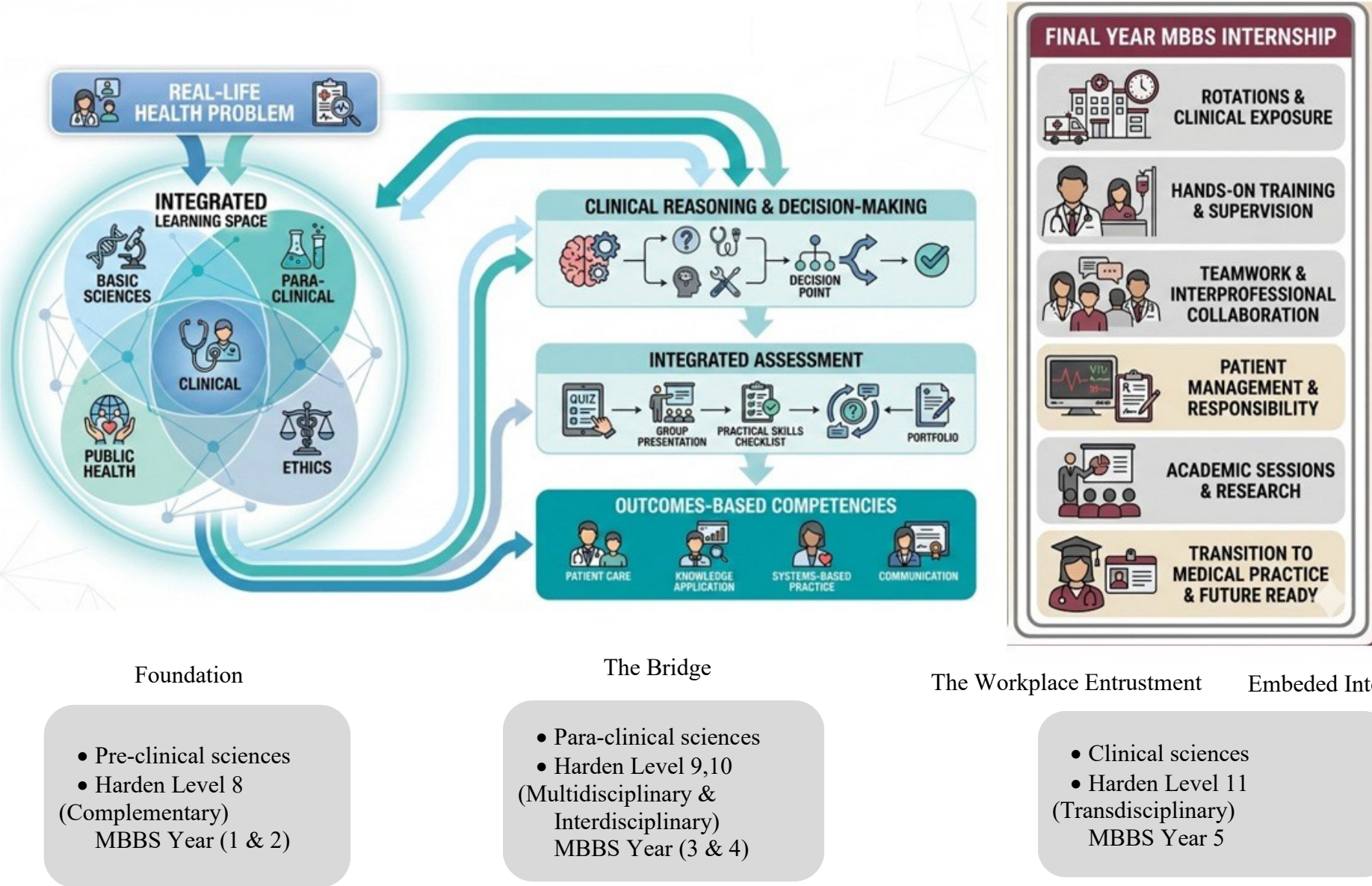


Figure 2

RMU – 12 Structured Framework of Integrated Modular MBBS Curriculum 2026
Isolation to Beyond Boundaries

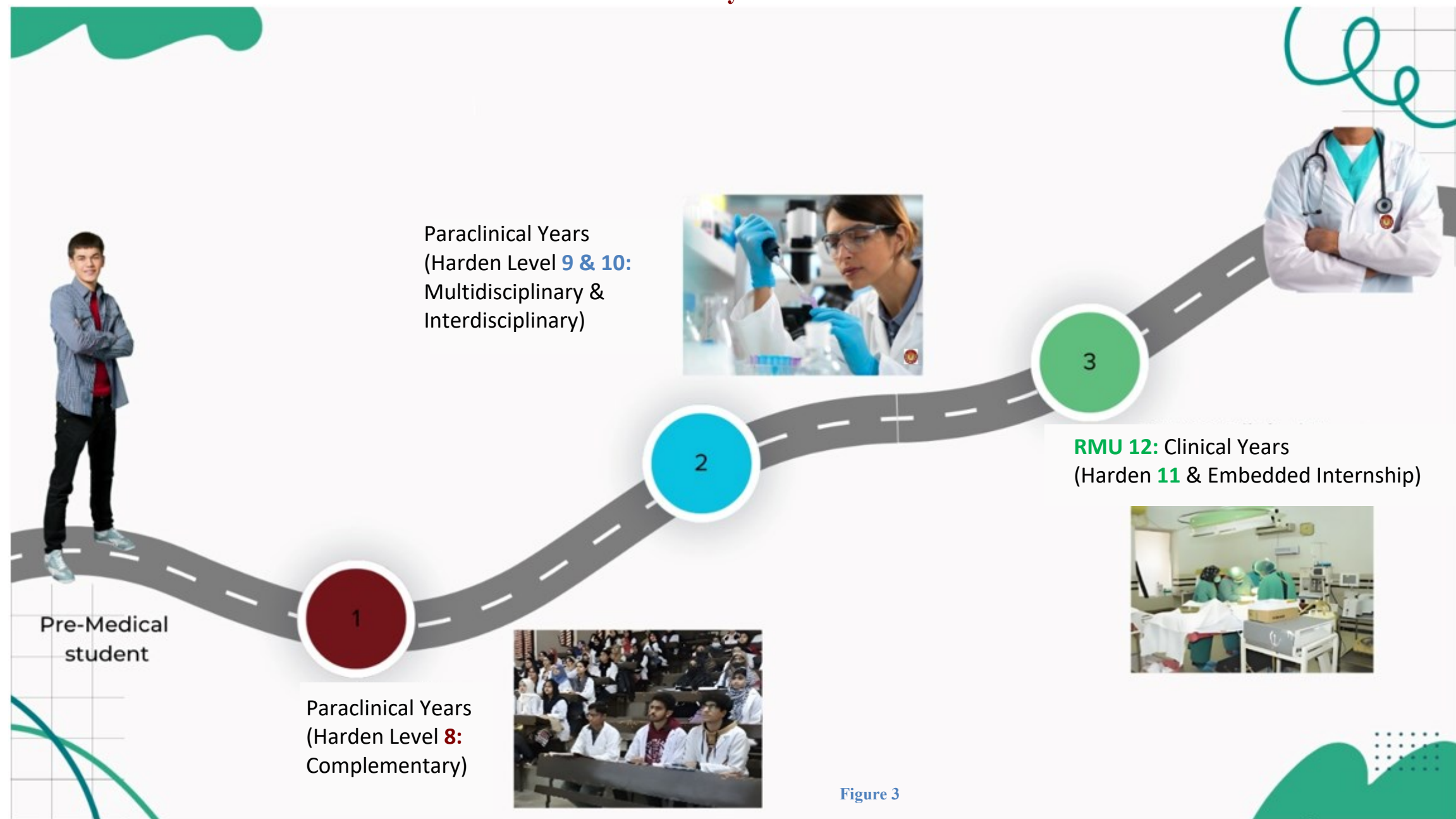


Figure 3

RMU – 12 Assessment Framework of Integrated Modular MBBS Curriculum 2026
Isolation to Beyond Boundaries

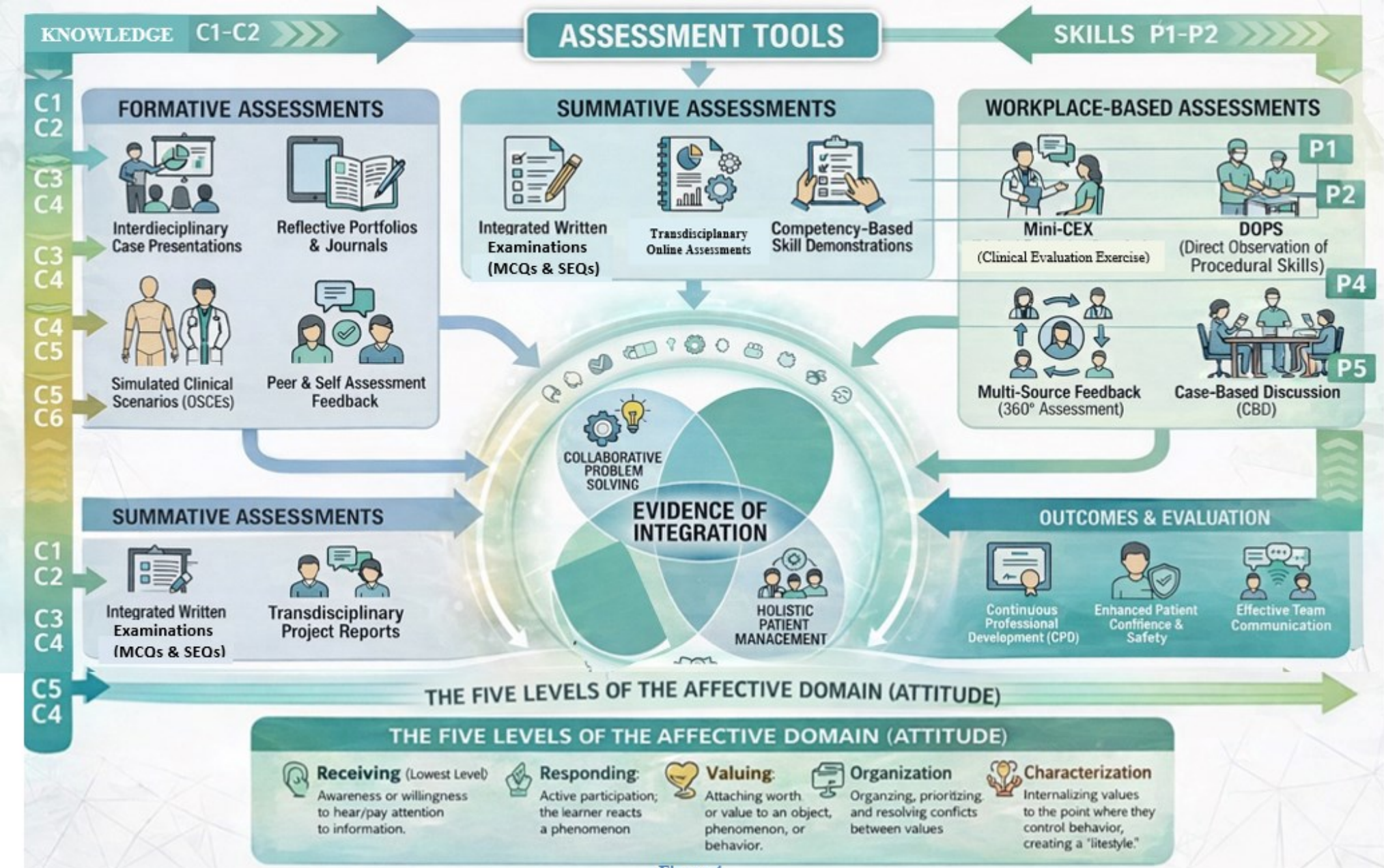


Figure 4

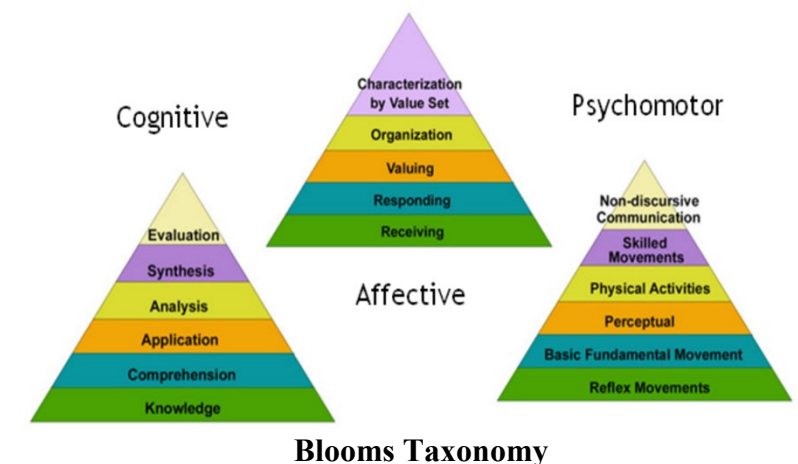
Rawalpindi Medical University has adopted a staged curricular framework that reflects a progressive movement along Harden’s integration ladder, culminating in going beyond the ladder to **RMU 12**. The curriculum is designed to ensure that knowledge acquired in the early years is not isolated or terminal, but is progressively contextualized, applied and transformed into professional competence. This progression is achieved by aligning curricular structure, teaching approaches and assessment strategies so that students move from conceptual understanding to integrated reasoning and finally to authentic clinical performance with graded responsibility.

Phase 1- The Foundation

In the early phase, basic sciences are organised using a complementary approach. The curriculum is structured into system- and theme-based modules rather than isolated subject courses, allowing Anatomy, Physiology, Biochemistry and related disciplines to retain their academic identity while contributing in a coordinated and mutually reinforcing manner. Learning outcomes are written at the module level and are intentionally framed to reflect conceptual understanding of systems rather than discipline-specific factual recall alone. Teaching is primarily discipline-led, but content delivery is carefully sequenced so that related concepts across subjects are taught in close temporal proximity. This sequencing is reinforced through planned integrated **multidisciplinary** activities such as problem-based learning, case-based learning and **clinico concept connect sessions** that require students to draw connections across disciplines. Teaching methods extend beyond lectures to include small-group discussions with structured clinical problem triggers that encourage early application of knowledge. Assessment in this phase is knowledge-focused, but incorporates integrated items and short clinical vignettes to test applied understanding (**C4 level**) across disciplines. These integrated assessment elements are deliberately introduced to prepare students for more complex synthesis (**C6 level**) in later phases, while maintaining the reliability. Regular interdisciplinary planning meetings and module coordination ensure coherence, avoid unnecessary duplication and maintain alignment between teaching and assessment.

Phase 2- The Bridge

As students enter the pre-clinical phase, the curriculum transitions into a multidisciplinary and subsequently interdisciplinary design. At this stage, curricular organisation shifts more clearly towards clinical systems and patient presentations, and learning outcomes emphasise the integration of knowledge, skills and reasoning across disciplines. Rather than subjects contributing independently, departments collaborate in the design and delivery of modules, and students encounter learning experiences that require simultaneous application of concepts from multiple domains. Teaching is increasingly delivered through team-based and co-facilitated sessions, with clinicians and basic scientists jointly guiding learning activities. Case-based learning, integrated practical sessions and simulation-based teaching become central modalities, allowing students to engage with clinically meaningful problems while still grounded in scientific principles.



The curriculum adopts a spiral structure in which key concepts are revisited at increasing levels of complexity, enabling deeper understanding and clinical relevance. In advanced pre-clinical components, the curriculum becomes explicitly task-oriented, focusing on common clinical presentations and professional activities rather than disciplinary content. At this stage, portfolios are introduced to support longitudinal documentation of learning, and early forms of workplace-linked assessment and entrustable activities are incorporated to familiarise students with performance-based expectations. Assessment strategies emphasise synthesis and reasoning, using integrated written examinations, complex case vignettes, OSCEs and structured simulation assessments. Decisions about student progress increasingly rely on aggregated evidence from multiple assessment tools and research projects.

Phase 3- The Workplace Entrustment

In the clinical phase, the curriculum becomes fully transdisciplinary, with learning embedded within authentic patient care and professional practice. Educational activities are organised around real clinical tasks, patient care pathways and **Entrustable Professional Activities** that reflect the core responsibilities of a graduating doctor. Students are integrated into clinical teams and participate in patient care under supervision, progressively assuming greater responsibility as competence is demonstrated. Teaching is predominantly workplace-based, supported by bedside teaching, coaching, reflective practice and targeted simulation for complex or high-risk activities. The distinction between disciplines becomes secondary to the holistic management of patients, as students are expected to integrate biomedical knowledge, clinical skills, communication, professionalism and teamwork in real settings. Assessment is programmatic and centred on performance in the workplace, using tools such as mini-CEX, DOPS, case-based discussions and multisource feedback. Evidence from these assessments is collected longitudinally within portfolios and reviewed by entrustment or competence committees to make informed decisions about progression and readiness for practice. Summative judgment is therefore based on sustained performance over time. Faculty roles evolve from subject teachers to supervisors, assessors and coaches, with explicit responsibility for observation, feedback and entrustment decisions. Diverse clinical exposure in tertiary public sector hospitals and community settings ensure adequate exposure, supervision and assessment opportunities, while quality assurance processes focus on the validity and consistency of entrustment decisions and learning experiences.



Miller's Pyramid of Clinical Competence

Phase 4- The Undergraduate Internship

The Undergraduate Internship is a structured, supervised transition phase designed to consolidate clinical competence and ensure readiness for the statutory house job. It provides learners with protected, workplace-based exposure focused on authentic patient care tasks, guided by clearly defined Entrustable Professional Activities aligned with international standards. Teaching emphasises supervised clinical practice, simulation for high-risk scenarios, and interprofessional teamwork, while assessment uses programmatic workplace-based tools, portfolios and entrustment decisions to judge safe, consistent performance. This level strengthens patient safety, reduces transition shock, and ensures that graduates enter the house job with demonstrable, documented readiness for independent supervised practice. Across all phases, the curriculum is underpinned by faculty development and continuous quality assurance. The staged movement from complementary through multidisciplinary and interdisciplinary learning to transdisciplinary clinical practice ensures that graduates are not only knowledgeable, but also capable of applying their learning effectively and safely in real clinical environments. This integrated and progressive design reflects contemporary best practices in medical education and aligns the educational experience with the expectations of modern healthcare systems.

Key Highlights

- Transcends Harden's Level 11 through integration with society, systems, ethics, and lifelong learning
- Fully aligned with PMDC undergraduate medical education standards
- Emphasizes higher-order thinking: Analysis, Evaluation, and Creation (Bloom's Taxonomy)
- Produces socially accountable, adaptive physicians prepared for 21st-century healthcare challenges

1. Foundations of Integration

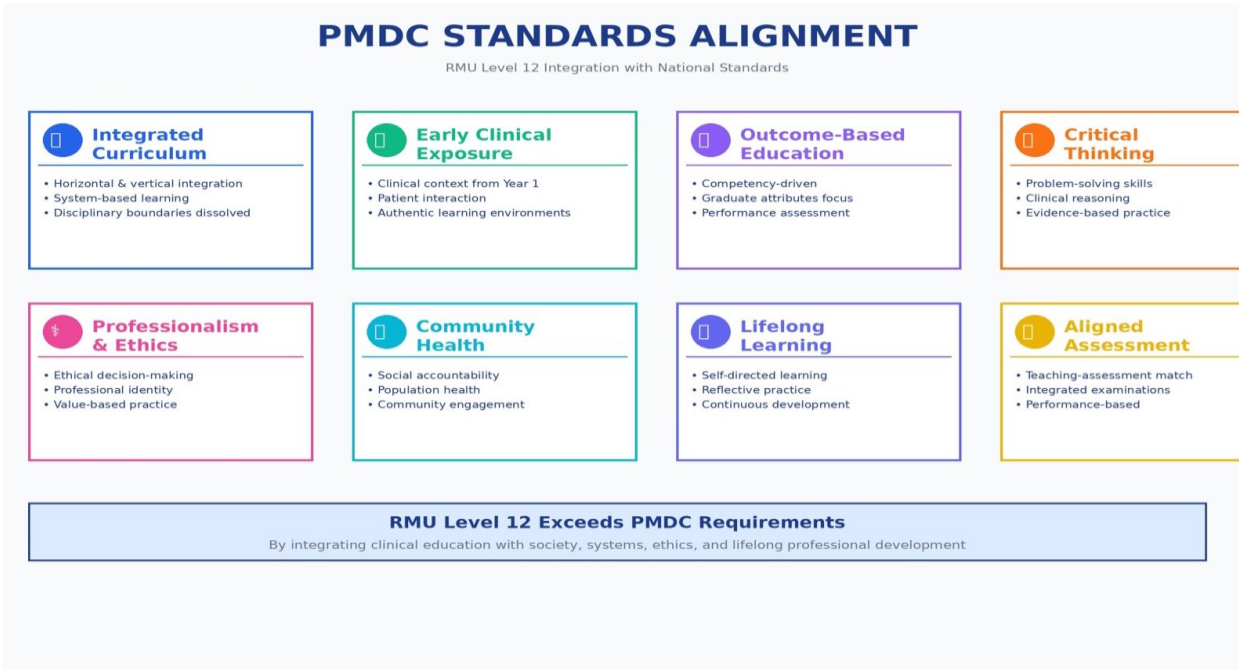
1.1 PMDC Standards for Medical Education

The Pakistan Medical and Dental Council mandates a transformative approach to undergraduate medical education characterized by:

- **Integrated Curriculum:** Horizontal integration (across disciplines) and vertical integration (across years)
- **Early Clinical Relevance:** Clinical context introduced from initial years
- **Outcome-Based Education:** Focus on graduate competencies rather than content coverage
- **Critical Thinking & Problem-Solving:** Development of analytical and evaluative skills
- **Professionalism & Ethics:** Embedded throughout the curriculum, not as isolated modules
- **Alignment of Teaching, Learning, and Assessment:** Constructive alignment with graduate outcomes

1.2 Harden's Integration Ladder: Overview

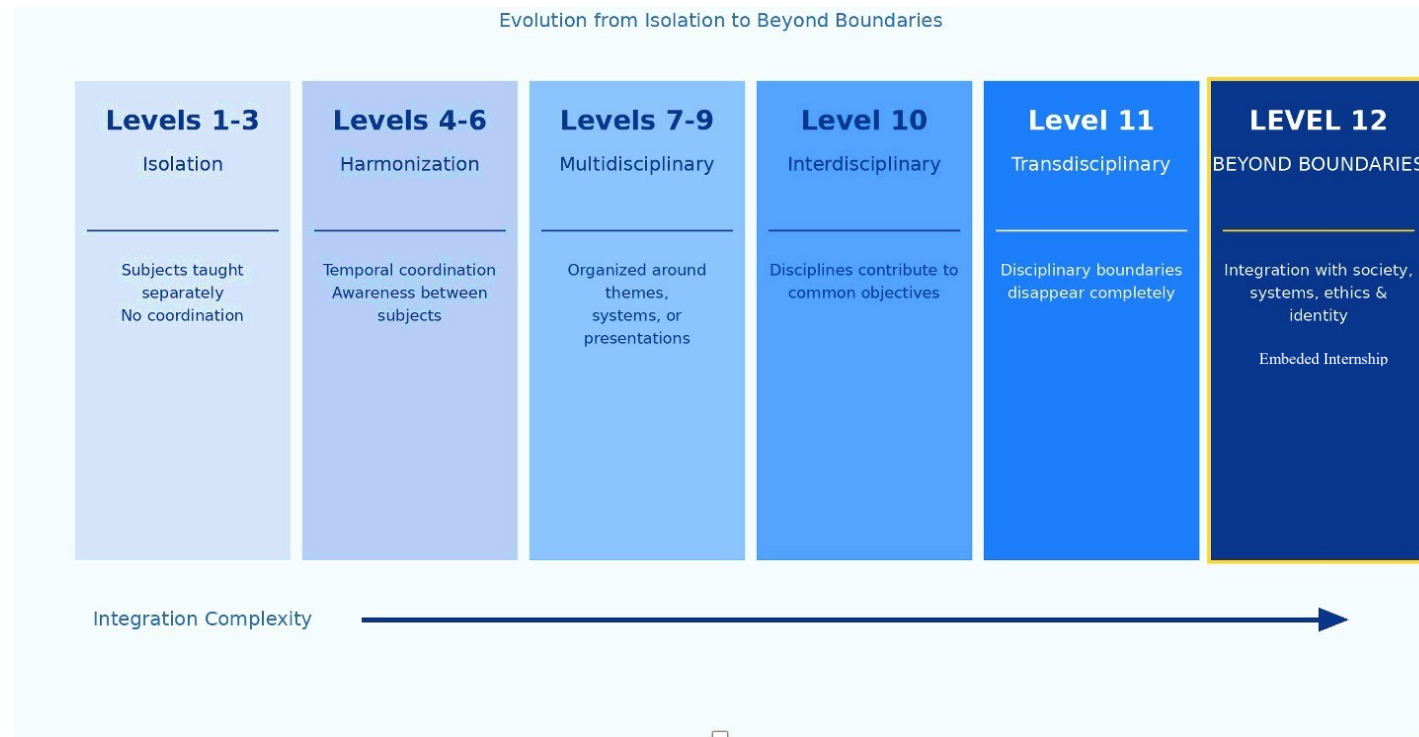
Harden's Integration Ladder provides a systematic framework for evaluating curricular integration, progressing through 11 levels:



Harden's Integration Ladder

RMU

RMU – 12 Beyond Boundaries



2. RMU Level 12 - Beyond Boundaries

2.1 Conceptual Definition

RMU Level 12: Beyond Boundaries Integration

A curriculum in which learning is organized not merely around disciplines or clinical problems, but around real-world health systems, societal needs, ethical complexity, population health challenges, and professional identity formation producing graduates who can adapt, lead, and innovate across contexts.

2.2 Why Level 12 Exists

While Harden's Integration Ladder culminates at Level 11 (Transdisciplinary Integration), contemporary medical education—particularly as mandated by PMDC—requires graduates who can function beyond the clinical encounter. RMU operates beyond transdisciplinary clinical integration by:

- Shifting the unit of integration from the patient alone to the patient embedded within society, systems, ethics, and professional identity
- Addressing health systems, governance, and resource allocation as integral learning domains
- Embedding knowledge creation and research literacy, not just knowledge synthesis
- Structuring lifelong learning and adaptive professionalism as explicit outcomes

2.3 Five Pillars of Level 12 Integration

A. Societal Integration: Patient-in-Society Problems

Level 11: Patient-centered clinical problems

RMU Level 12: Patient-in-society problems

RMU Implementation:

- Community-based medical education

- Analysis of social determinants of health
- Preventive and promotive healthcare strategies
- Health equity considerations in clinical decision-making

Students don't merely diagnose disease they analyze population patterns and design interventions, requiring evaluation and creation (Bloom's highest levels).

B. Value-Based Integration: Contextual Ethics

Level 11: Ethics integrated within cases

RMU Level 12: Ethics embedded longitudinally in real decisions

RMU Implementation:

- Ethical dilemmas arising from real patient encounters, not hypothetical scenarios



- Continuous professional identity formation throughout the curriculum
- Assessment of reflective practice and ethical reasoning

Students must weigh competing values, manage uncertainty, and justify actions—hallmarks of evaluation-level cognition.

C. System-Level Integration: Healthcare Systems & Leadership

Level 11: Focus on individual patient care

RMU Level 12: Focus on healthcare systems and governance

RMU Implementation:

- Exposure to health systems functioning and policy implications
- Understanding resource allocation realities
- Leadership and teamwork competencies

Students evaluate trade-offs between individual benefit and population good something no single discipline or clinical problem can teach.

D. Knowledge Creation: Beyond Synthesis

Level 11: Knowledge synthesis **RMU Level 12:** Knowledge generation

RMU Implementation:

- Research literacy and critical appraisal skills
- Clinical audits and community health projects
- Evidence-based practice and innovation

Students formulate research questions, design solutions, and create outputs—aligning with the creation level of Bloom's Taxonomy.

LEVEL 11 vs LEVEL 12	
The Evolution Beyond Transdisciplinary Integration	
LEVEL 11 Transdisciplinary	LEVEL 12 Beyond Boundaries
Unit of Integration	Unit of Integration
Patient problem	Patient within society, systems, and ethics
Primary Focus	Primary Focus
Clinical problem-solving	Clinical + population health + systems thinking
Scope	Scope
Individual patient care	Individual care + community + healthcare systems
Ethics Approach	Ethics Approach
Integrated within cases	Longitudinally embedded in real decisions
Knowledge Type	Knowledge Type
Knowledge synthesis	Knowledge creation & generation
Learning Organization	Learning Organization
Around clinical problems	Around health challenges & society
Disciplinary Boundaries	Disciplinary Boundaries
Dissolved in teaching	Extended to societal integration
Graduate Outcome	Graduate Outcome
Competent clinician	Adaptive, socially accountable professional
Bloom's Taxonomy	Bloom's Taxonomy
Primarily Analysis	Analysis → Evaluation → Creation

E. Temporal Integration: Lifelong Professional Identity

Level 11: Competent graduate **RMU Level 12:** Adaptive professional

RMU Implementation:

- Reflective portfolios documenting professional growth
- Self-directed learning plans
- Feedback-driven continuous improvement

Graduates leave with the ability to identify learning needs and adapt to new contexts—temporal integration across undergraduate education and professional life.

3. Alignment with PMDC Standards

The following table demonstrates explicit mapping between PMDC graduate competencies, RMU curriculum implementation, and justification for Level 12 integration:

4. Bloom's Taxonomy & Higher-Order Thinking

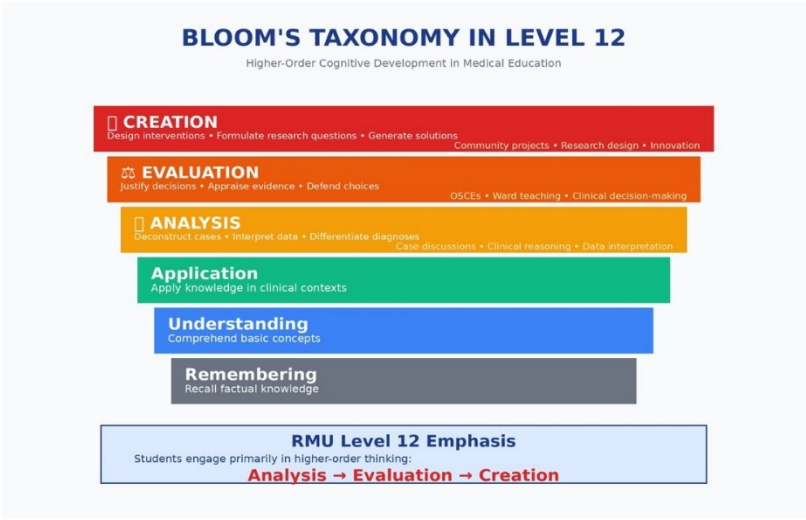
PMDC Competency	RMU Implementation	Level 12 Justification
Medical Knowledge	Integrated system-based modules combining anatomy, physiology, pathology, pharmacology, radiology, and clinical medicine	Knowledge constructed through real patient problems; subject boundaries dissolved
Clinical Skills & Patient Care	Early clinical exposure, bedside teaching, skills labs, OSCEs	Skills and knowledge learned simultaneously in authentic clinical contexts
Clinical Reasoning	Case-based learning, problem-based tutorials, integrated examinations	Learning organized around clinical problems requiring synthesis beyond single disciplines
Communication Skills	Longitudinal communication training embedded in OSCEs and ward teaching	Communication competencies embedded within patient encounters, not isolated modules
Professionalism & Ethics	Longitudinal professionalism themes, ethics discussions during clinical rotations	Ethical reasoning contextualized within patient care—extends to value-based integration
Community & Preventive Health	Community-based medical education, public health projects, outreach programs	Integrates clinical medicine with population health and social determinants— societal integration
Lifelong Learning	Reflective practice, research literacy, self-directed learning tasks	Students identify learning needs from clinical encounters—temporal integration

RMU's curriculum explicitly targets higher-order cognitive domains of Bloom's Taxonomy:

- **Analysis:** Breaking down complex clinical cases, interpreting investigations, differentiating diagnoses
- **Evaluation:** Appraising evidence, justifying management decisions, defending clinical choices
- **Creation:** Designing interventions, formulating research questions, developing solution

4.1 Learning Activities Mapped to Bloom's Levels

Learning Activity	Bloom's Level	Justification
Integrated case-based discussions	Analysis	Students deconstruct complex cases, interpret investigations, differentiate diagnoses
Ward-based clinical teaching	Analysis → Evaluation	Learners appraise patient data and justify management decisions in real time
OSCEs and scenario-based stations	Evaluation	Students defend clinical decisions, prioritize care, demonstrate judgment under pressure
Community health projects	Evaluation → Creation	Learners assess community needs and design context-specific preventive interventions
Research projects & clinical audits	Creation	Students formulate questions, design studies, generate new knowledge



GRADUATE OUTCOMES

Level 12 Integration Produces Adaptive Professionals

CORE COMPETENCIES

✔ Clinical Excellence

Evidence-based practice
Diagnostic reasoning
Patient safety

✔ Professionalism

Ethical decision-making
Patient-centered care
Accountability

✔ Communication

Effective patient interaction
Interprofessional collaboration
Cultural competence

✔ Population Health

Community engagement
Preventive focus
Health promotion

ADAPTIVE CAPABILITIES

▢ Systems Thinking

Health systems understanding
Policy awareness
Resource management

▢ Research Literacy

Critical appraisal
Knowledge generation
Evidence synthesis

▢ Lifelong Learning

Self-directed growth
Reflective practice
Adaptive expertise

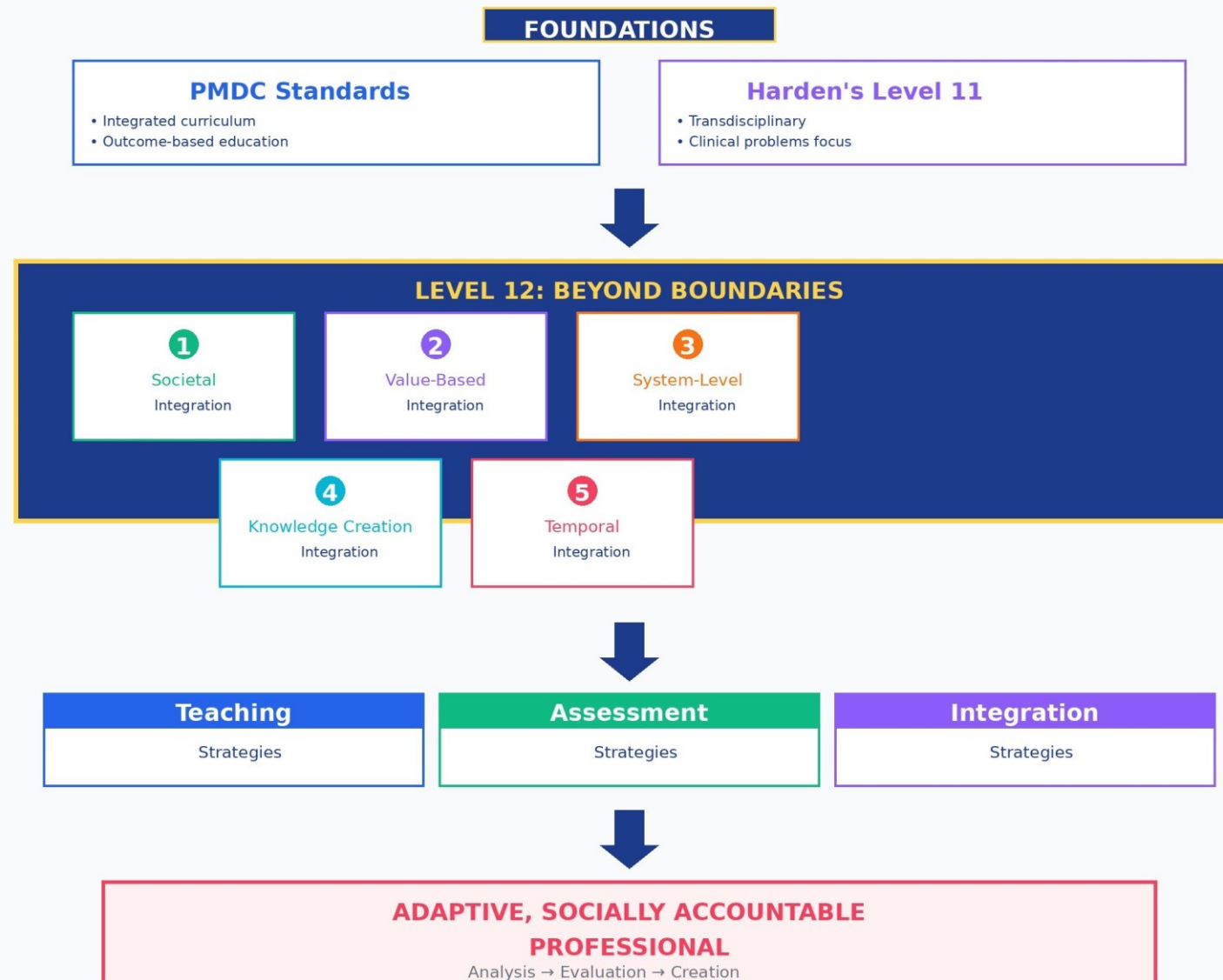
▢ Leadership

Innovation
Change management
Team development

**ADAPTIVE, SOCIALLY ACCOUNTABLE
PROFESSIONAL**

RMU LEVEL 12 FRAMEWORK

Complete Conceptual Flow



Conclusion

Rawalpindi Medical University's curriculum exemplifies a transformational approach to medical education that extends beyond traditional disciplinary integration. By achieving **Level 12: Beyond Boundaries Integration**, RMU demonstrates that modern medical education must prepare graduates not only as competent clinicians but as adaptive, reflective, socially accountable professionals capable of navigating complex health systems, ethical dilemmas, and evolving healthcare landscapes.

This framework, fully aligned with PMDC standards and grounded in Bloom's higher-order cognitive domains, positions RMU as an innovator in outcome-based, student-centered medical education that produces physicians prepared for 21st-century healthcare challenges.

The Five Pillars of Level 12 Societal Integration, Value-Based Integration, System-Level Integration, Knowledge Creation, and Temporal Integration—collectively represent a holistic vision for medical education that transcends disciplinary boundaries and prepares graduates for lifelong professional excellence.

Key Takeaways for Educators

- Level 12 integration is achievable through deliberate curriculum design aligned with regulatory standards
- Higher-order thinking (Analysis, Evaluation, Creation) must be explicitly embedded in learning activities
- Integration extends beyond clinical problems to encompass society, systems, ethics, and professional identity
- Assessment strategies must align with transdisciplinary learning objectives
- The ultimate goal is producing adaptive professionals, not merely competent graduates

Clinico - Concept Connect Session (C³6)

Introduction:

A Clinico -Concept Connect Session is a **case-based, concept-driven educational encounter** in which a carefully designed clinical scenario is used as the central anchor to explore and integrate relevant concepts from basic and clinical sciences. This **Session** is an integrated teaching–learning activity designed to bridge the gap between **foundational biomedical concepts** and their **real-world clinical application**. It serves as a structured platform where students actively connect basic science principles with clinical reasoning, patient presentation, and professional decision-making, thereby promoting deeper understanding and long-term retention of knowledge.

This session moves beyond traditional discipline-based teaching by fostering **conceptual integration**, **contextual learning**, and **early clinical exposure**, enabling students to appreciate the relevance of basic sciences in patient care from the outset of their medical training.

Rather than teaching facts in isolation, the session emphasizes:

- Understanding **why** a concept matters clinically
- Applying **core principles** to explain patient findings
- Developing **clinical reasoning skills** in a guided, safe learning environment

The focus remains on **conceptual clarity**, **clinical correlation**, and **professional competence**, rather than diagnosis-driven or management-heavy discussions.

Structure of the Clinico -Concept Connect Session

The session is structured into clearly defined phases to ensure alignment with learning outcomes and progressive student engagement:

1. Clinical Trigger (Case Introduction)

- A concise, authentic clinical scenario is presented.
- The case is selected to naturally elicit key underlying concepts.
- Information is disclosed in a focused manner to stimulate curiosity and inquiry.

2. Concept Mapping and Exploration

- Relevant foundational concepts (e.g., physiological mechanisms, biochemical pathways, structural–functional relationships) are identified.
- Students are guided to link clinical signs, symptoms, and investigations to these concepts.

C3: Clinico Concept Connect

C6: Bloom's Level C6 (Creation / Synthesis)

Learners integrate knowledge from basic, para-clinical, and clinical sciences to formulate differential diagnoses, management plans, or clinical reasoning pathways, demonstrating higher-order thinking and decision-making.

Reference: Anderson, L. W., & Krathwohl, D. R. (2001). A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives.

- Emphasis is placed on **mechanisms**, not memorization.

3. Integrated Discussion

- Faculty from relevant disciplines facilitate discussion collaboratively.
- Concepts are reinforced through clinical correlation and guided questioning.
- Students actively participate in explaining findings using scientific reasoning.

4. Application and Reflection

- Learners reflect on how conceptual understanding informs clinical thinking.
- Key take-home messages are summarized.
- Opportunities for self-directed learning and further exploration are highlighted.

Implementation Strategy

The Clinico -Concept Connect Session is implemented as a **planned, scheduled activity** within the integrated curriculum and follows these principles:

- **Faculty Collaboration:** Basic science and clinical faculty jointly design and facilitate sessions to ensure coherence and relevance.
- **Curriculum Alignment:** Each session is mapped to predefined learning outcomes, competencies, and entrustable professional activities.
- **Active Learning:** Small-group discussions, guided questioning, and concept linking are emphasized over didactic teaching.
- **Progressive Complexity:** Early sessions focus on core concepts, with increasing clinical depth as students advance.
- **Feedback and Reflection:** Structured feedback is provided to reinforce learning and improve reasoning skills.

Educational Value

Through its integrated design, the Clinico -Concept Connect Session:

- Strengthens **conceptual understanding**
- Enhances **clinical reasoning and analytical skills**
- Encourages **horizontal and vertical integration**
- Promotes **student engagement and ownership of learning**
- Prepares learners to become **practice-ready, concept-driven clinicians**

Example of Clinico - Concept Connect (C³6) Session

Theme Title from Molecules to Medicine: Clinical Applications of Molecular Biology and Genetics

Clinico -Concept Connect (C³6) Session

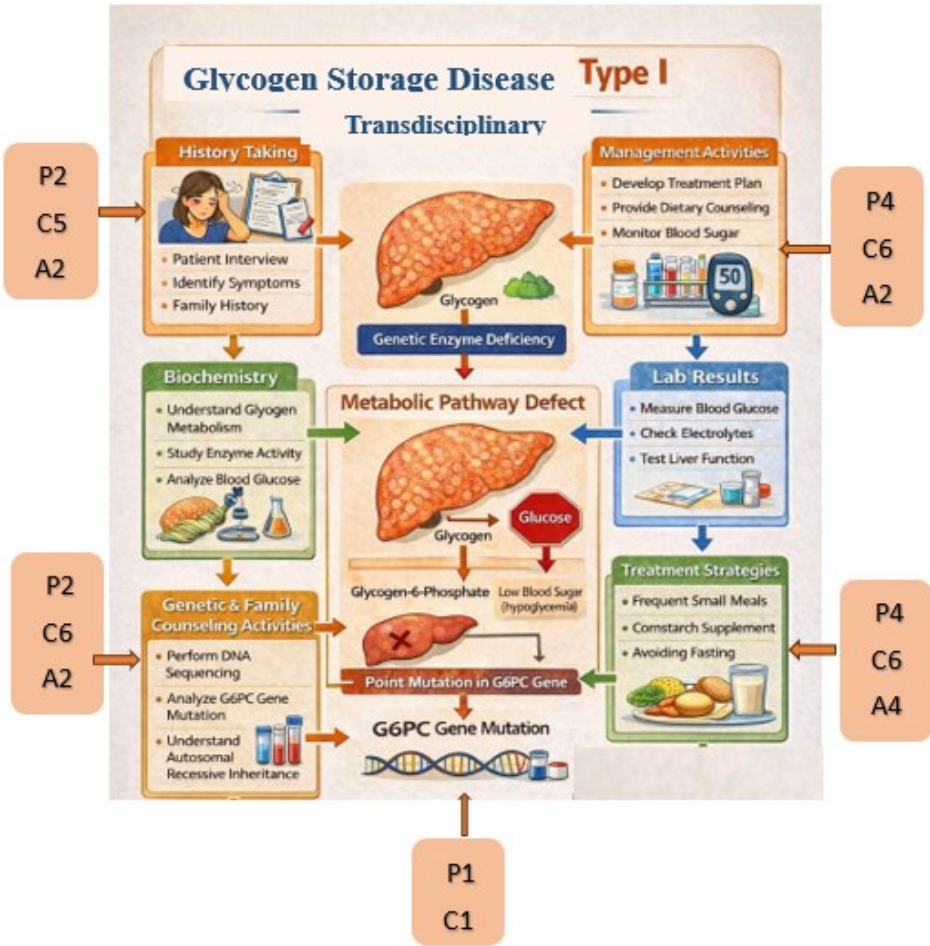
Clinical Case Scenario: A lady with progressive fatigue

A 22-year-old woman presents to the outpatient clinic with progressive fatigue, muscle weakness, and episodes of dizziness, particularly after prolonged fasting. She reports poor exercise tolerance and occasional nausea. There is no history of infection or chronic illness. A sibling has a similar condition. On examination, she appears thin but alert. Vital signs are stable. Mild proximal muscle weakness is noted. There is no organomegaly.

Laboratory and Molecular Findings

- Fasting blood glucose: Low
- Serum electrolytes: Normal
- Enzyme activity assay: Reduced activity of a glucose-metabolizing enzyme
- Genetic analysis: Point mutation in enzyme-encoding gene
- Family screening: Similar mutation identified

This case exemplifies how a **single molecular defect** leads to systemic clinical manifestations, reinforcing the transition from molecular mechanisms to patient-centered medicine



Clinico-Concept Connect (C³6) Sessions
Transdisciplinary Integration (Harden Level 11)

Educational Relevance to Theme

This case allows learners to trace disease progression:

Gene mutation → Altered protein structure → Enzyme dysfunction → Metabolic failure →

Clinical presentation

It reinforces:

- Gene expression and mutation
- Enzyme kinetics and regulation
- Metabolic adaptation during fasting
- Familial inheritance patterns
- Role of molecular diagnostics in clinical practice

Learning Objectives

By the end of this theme, the student will be able to:

- Explain the molecular basis of gene expression, including transcription, translation, and regulation of enzymes.
- Describe the role of enzymes, cofactors, and inhibitors in normal metabolic processes and disease states.
- Correlate molecular and genetic abnormalities with common clinical conditions such as metabolic disorders, infertility, and cancer.
- Understand basic molecular mechanisms underlying inherited and acquired genetic diseases.
- Apply principles of molecular biology and genetics to interpret simple clinical and laboratory scenarios.

Appreciate the relevance of molecular medicine in diagnosis, prognosis, and therapeutic decision-making.

Integration Framework

Harden Level 9 – Multidisciplinary Integration

This C³6 session operates at **Harden Level 9**, where multiple disciplines address the same clinical problem in parallel, maintaining disciplinary identity while reinforcing conceptual alignment.

Disciplines Involved

- **Anatomy**

Domains of Learning According to Blooms Taxonomy					
Cognitive Domain: knowledge and mental skills. (C)		Psychomotor Domain: Motor skills. (P)		Affective Domain: feelings, values, dispositions, attitudes, etc (A)	
• C1	Remembering	P1	Imitation	A1	Receive
• C2	Understanding	P2	Manipulation	A2	Respond
• C3	Applying	P3	Precision	A3	Value
• C4	Analyzing	P4	Articulation	A4	Organize
• C5	Evaluating	P5	Naturalization	A5	Internalize
• C6	Creating				

- Liver and skeletal muscle structure involved in glucose metabolism
- Anatomical basis of muscle weakness and exercise intolerance
- **Biochemistry**
 - Enzyme kinetics, regulation, and metabolic pathways
 - Impact of genetic mutations on enzyme activity
- **Medicine**
 - Clinical evaluation of fasting hypoglycemia
 - Diagnostic reasoning in inherited metabolic disorders
- **Surgery**
 - Peri-procedural metabolic considerations
 - Role in diagnostic evaluation where indicated

Each discipline contributes **complementary insights** without content fusion, fulfilling the criteria of multidisciplinary integration

Explicit EPA Mapping

EPA-1: Interpret Clinical and Laboratory Data

Entrustment Level: 1–2

Students interpret fasting glucose levels and enzyme assays under supervision.

EPA-2: Apply Basic Science to Clinical Reasoning

Entrustment Level: 1

Students explain how molecular mutations produce clinical disease.

EPA-3: Communicate Findings in a Structured Manner

Entrustment Level: 1–2

Students present the case during group discussions.

EPA-4: Demonstrate Professionalism and Teamwork

Entrustment Level: 1

Students engage respectfully in multidisciplinary learning.

Mapping to Harden Levels

- **Level 8 (Complementary):**
Coordinated teaching of genetics, biochemistry, and anatomy around a shared theme
- **Level 9 (Multidisciplinary):**
Parallel disciplinary analysis of the same clinical case
- **Level 10 (Interdisciplinary):**
Early synthesis of molecular, biochemical, and clinical data into a unified explanation

Teaching–Learning Strategy

- Case-based discussion
- Facilitated multidisciplinary dialogue
- Guided molecular-to-clinical reasoning
- Early clinical exposure emphasis

Assessment Alignment

- MCQs (conceptual and application-based)
- SAQs focusing on molecular–clinical correlation
- OSPE/OSVE elements where applicable

Summary Statement

Theme Five exemplifies RMU-12’s philosophy of “From Isolation to Beyond Boundaries” by translating molecular biology and genetics into meaningful clinical understanding through a structured Clinico -Concept Connect session. Operating at Harden Level 9 and aligned with early EPAs, this theme prepares students for progressive entrustment, clinical reasoning, and future practice-ready learning in molecular and precision medicine.

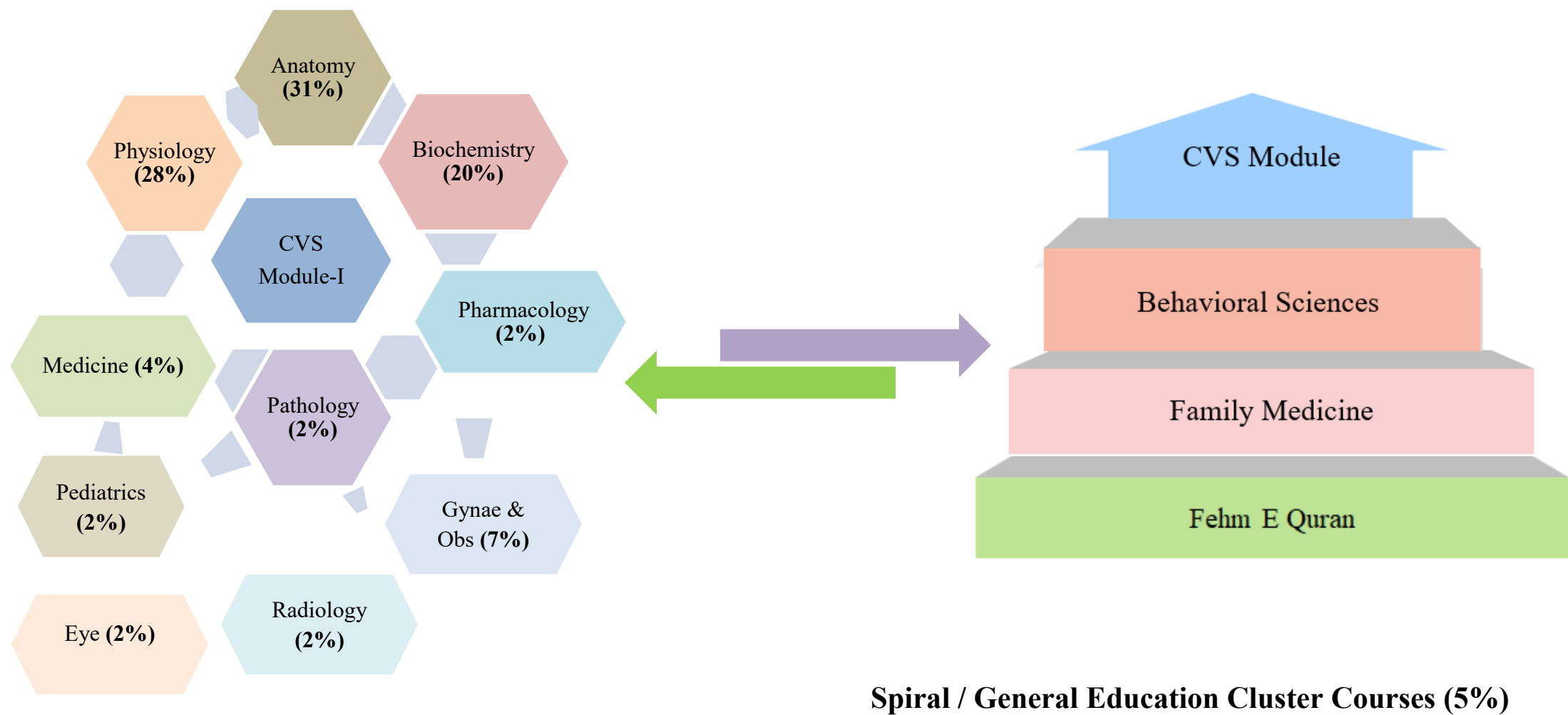
RMU – 12 Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries

Study Guide

CVS Module-I

Multi-Disciplinary Integration



Disciplines in CVS Module-I

Discipline Wise Details of Modular Content

Integration Themes					
Block	Department	General Anatomy	Embryology	Histology	Gross Anatomy
III	Anatomy	Heart & Vessels	Cardiovascular System	Heart & Vessels	Mediastinum, Heart, Great Vessels
	Biochemistry	Carbohydrate chemistry, Lipid chemistry			
	Physiology	- The Heart as a Pump and Function of the Heart Valves& regulation of heart pumping, cardiac cycle - Rhythmical Excitation of the Hear &Specialized excitatory&conductive system of the heart & its control (revisit) - Electrocardiogram, its interpretation & its abnormalities - Medical Physics of Pressure, Flow, and Resistance, Vascular Distensibility and Functions of the Arterial and Venous Systems - Microcirculation and the Lymphatic System, Local and Humoral Control of Blood Flow by the Tissues - Nervous Regulation of the Circulation, and Rapid & Long-Term Control of Arterial Pressure, hypertension - Cardiac Output, Venous Return, and Their Regulation - Muscle Blood Flow and Cardiac Output During Exercise; the Coronary & regional circulation - Cardiac Failure, Circulatory Shock - Heart Valves and Heart Sounds; Dynamics of Valvular and Congenital Heart Defects			
	Spiral Courses				
	Behavioural Sciences	- Sociology & Health - Anthropology & Health			
	Family Medicine	Approach to a patient with chest pain			
	Vertical Integration				
	Pathology	Edema			
	Pediatric	Congenital Heart Diseases			
	Eye	Retinal changes in hypertension			
	Pharmacology	- Clinical Pharmacology of Anti hypertensive drugs - Clinical pharmacology of antianginal - Clinical Pharmacology of Anti hypertensive drugs			
	Medicine	- Overview of acute coronary syndrome - Management of heart failure & shock - Hypertension - Dyspnea - Myocardial Infarction (MI)			
	Radiology	Chest radiograph with perspective of cardiovascular system			
	Gynae & Obs	- Cardiovascular changes in pregnancy, - Hypertensive disorders in pregnancy (gestational hypertension, pre-eclampsia)			

CVS Module Team

Module Name	:	CVS Module
Duration of module	:	05 Weeks
Coordinator	:	Dr. Aneela Yasmeen
Co-Coordinator	:	Dr. Sheena Tariq
Reviewed by	:	Module Committee

Module Committee			Module Task Force Team		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar	1.	Coordinator	Dr. Aneela Yasmeen (Senior Demonstrator of Physiology)
2.	Director DME & Dean Basic Sciences	Prof. Dr. Ifra Saeed	2.	DME Focal Person	Dr. Farzana Fatima
3.	Additional Director (Assessment) DME	Dr. Arsalan Manzoor Mughal	3.	Co-coordinator	Dr. Kashif Ashraf (Senior Demonstrator of Anatomy)
4.	Chairperson Physiology	Prof. Dr. Samia Sarwar	4.	Co-Coordinator	Dr. Sheena Tariq (Senior Demonstrator of Physiology)
5.	Chairperson Anatomy	Prof. Dr. Ayesha Yousaf	5.	Co-coordinator	Dr. Rahat (Senior Demonstrator of Biochemistry)
6.	Chairperson Biochemistry	Dr. Aneela Jamil			
7.	Focal Person Anatomy 1 st Year MBBS	Ass. Prof. Dr. Tayyaba Qureshi			
8.	Focal Person Physiology	Dr. Sidra Hamid	DME Implementation Team		
9.	Focal Person Pharmacology	Dr. Zunera Hakim	1.	Director DME	Prof. Dr. Ifra Saeed
10.	Focal Person Pathology	Dr. Syeda Aisha	2.	Implementation Incharge 1 st & 2 nd Year MBBS	Dr. Arsalan Manzoor Mughal
11.	Focal Person Behavioral Sciences	Dr. Zona Tahir			Dr. Farzana Fatima
12.	Focal Person Community Medicine	Dr. Afifa Kulsoom	3.	Assistant Director DME	Dr. Farzana Fatima
13.	Focal Person Quran Translation Lectures	Dr. Fahd Anwar	4.	Editor	Muhammad Arslan Aslam
14.	Focal Person Family Medicine	Dr. Sadia Khan			

Module V – CVS Module

Rationale: The main role of the cardiovascular system in the body is to transport oxygen to all tissues in the body and for removing, from these same tissues, metabolic waste products. The system itself consists of the blood, the medium for exchanging oxygen, nutrients and waste products throughout the body, the blood vessels, the pipes through which the blood flows and the heart, the pump which forces blood to flow through the blood vessels.

Cardiovascular health is important in maintaining overall health and wellness. This module will teach how heart and cardiovascular system work when healthy, and what happens when diseased. We will explore through lectures, SGDs and skill lab normal anatomy, physiology, biochemistry of CVS. This module will briefly discuss the common CVS diseases & their prevention, therapeutic drug treatment, behavioral aspects, radiological findings.

Module Outcomes

At the end of this module the student should be able to:

Knowledge:

1. Explain the structural & developmental organization of CVS.
2. Explain different waves, segment and intervals of ECG and apply it to the interpretation of ECG.
3. Use technology based medical education including.

Artificial Intelligence.

4. Appreciate concepts & importance of
Family Medicine
Biomedical Ethics
Research

Skill:

1. Understand the physiology of conductive system of heart, cardiac cycle.
2. Must understand the pathophysiology of edema, infarction, shock and thrombosis.

Attitude:

- Demonstrate **Professional Attitude, Team-Building Spirit and Good Communication Specially in Small Group Discussions.**

Terms & Abbreviations

Contents

- Domains of Learning
- Teaching and Learning Methodologies/Strategies
 - Clinico Concept Connect Session (C³6)
 - Large Group Interactive Session (LGIS)
 - Small Group Discussion (SGD)
 - Self-Directed Learning (SDL)
 - Case Based Learning (CBL)
 - Problem- Based Learning (PBL)
 - Skill Labs/Practicals (SKL)

Tables & Figures

- Table1. Domains of learning according to Blooms Taxonomy
- Figure 1. Prof Umar's Model of Integrated Lecture
- Table2. Standardization of teaching content in Small Group Discussions
- Table 3. Steps of taking Small Group Discussions
- Figure 2. PBL 7 Jumps Model

Table 1. Domains of Learning According to Blooms Taxonomy

Sr. #	Abbreviation	Domains of learning
1.	C	Cognitive Domain: knowledge and mental skills.
	• C1	Remembering
	• C2	Understanding
	• C3	Applying
	• C4	Analyzing
	• C5	Evaluating
	• C6	Creating
2.	P	Psychomotor Domain: Motor skills.
	• P1	Imitation
	• P2	Manipulation
	• P3	Precision
	• P4	Articulation
	• P5	Naturalization
3.	A	Affective Domain: feelings, values, dispositions, attitudes, etc
	• A1	Receive
	• A2	Respond
	• A3	Value
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	• A5	Internalize

Teaching and Learning Methodologies / Strategies

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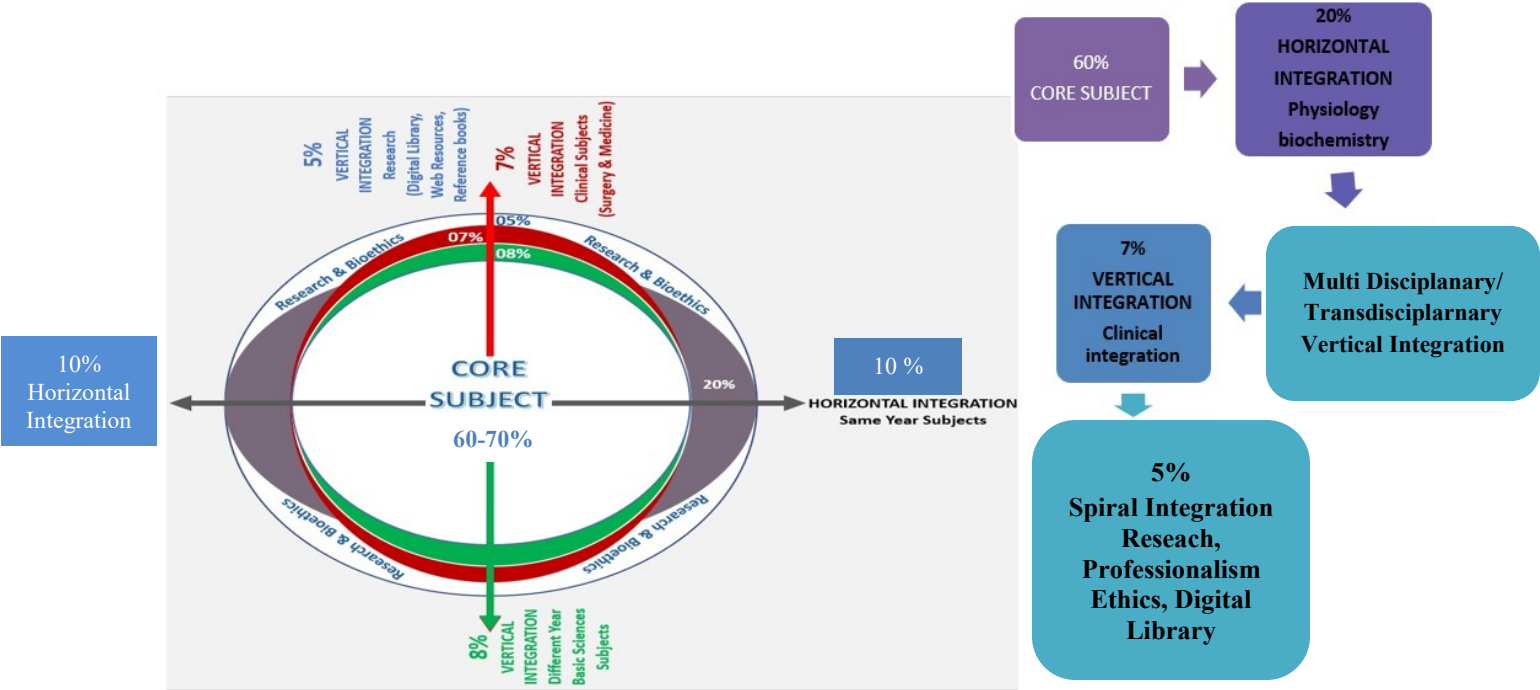
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- Encourages **horizontal and vertical integration**
- Promotes **student engagement and ownership of learning**
- Prepares learners to become **practice-ready, concept-driven clinicians**

Large Group Interactive Session (LGIS)

The large group interactive session is structured format of Prof Umar Model of Integrated lecture. It will the followed for delivery of all LGIS. The lecturer will introduce a topic or common clinical condition and explains the underlying phenomena through questions, pictures, videos of patients, interviews, and exercises, etc. Students are actively involved in the learning process.



Prof Umar’s Model of Integrated Lecture

Small Group Discussion (SGD)

This format helps students to clarify concepts acquire skills and attitudes. Sessions are structured with the help of specific exercises such as patient case, interviews or discussion topics or power point presentations. Students exchange opinions and apply knowledge gained from lectures, SGDs and self study. The facilitator role is to ask probing questions, summarize and help to clarify the concepts.

Table 2. Standardization of teaching content in Small Group Discussions

S. No	Topics	Approximate %
1	Title Of SGD	
2	Learning Objectives from Study Guides	
3	Core Concepts of the topic	60%
4	Horizontal Integration	24%
5	Vertical Integration	08%
6	Related Advance Research points	08%
7	Related Ethical points	
8	Artificial Intelligence	
9	Family Medicine	

Table 3. Steps of Implementation of Small Group Discussions

Step 1	Case presentation and sharing of learning objectives by using students study guides	First 5 minutes
Step 2	Asking students pre-planned questions from previous teaching session to develop co-relation (these questions will be standardized)	5minutes
Step 3	Students divided into groups of three and allocation of learning objectives	5minutes
Step 4	ACTIVITY: Students will discuss the learning objectives among themselves	15 minutes
Step 5	Each group of students will present its learning objectives	20 min
Step 6	Discussion of learning content in the main group	30min
Step 7	Clarification of concept by the facilitator by asking structured questions from learning content	15 min
Step 8	Questions on core concepts	
Step 9	Questions on horizontal integration	
Step 10	Questions on vertical integration	
Step 11	Questions on related research article	
Step 12	Questions on related ethics content	
Step 13	Students Assessment on online MS teams (5 MCQs)	5 min
Step 14	Summarization of main points by the facilitator	5 min
Step 15	Students feedback on the SGD and entry into log book	5 min
Step 16	Ending remarks	

Self-Directed Learning (SDL)

- Self-directed learning is a process where students take primary charge of planning, continuing, and evaluating their learning experiences.
- Time Home assignment
- Learning objectives will be multi-disciplinary/transdisciplinary and interdisciplinary.
- Learning resources will be given to students = Textbook (page no), web site
- Assessment:
 - i Will be online on LMS (Mid module/ end of Module)
 - ii.OSPE station

Case Based Learning (CBL)

- It's a learner centered model which engages students in discussion of specific case scenarios that typically resemble real world examples.
- Case Scenarios must be multi-disciplinary/transdisciplinary and interdisciplinary
- Case scenario will be given to the students
- Will engage students in discussion of specific scenarios that resemble or typically are real-world examples.
- Learning objectives will be given to the students and will be based on
 - i. To provide students with a relevant opportunity to see theory in practice
 - ii. Require students to analyze data in order to reach a conclusion.
 - iii. Develop analytic, communicative, and collaborative skills along with content knowledge.

Problem Based Learning (PBL)

- Problem-based learning (PBL) is a student-centered approach in which students learn about a subject by working in groups to solve an open-ended problem.
- This problem is what drives the motivation and the learning.

The 7- Jump-Format of PBL (Maastricht Medical School)		Learning Domain
Step 7	Synthese & Report	C6
Step 6	Collect Information from outside	C6
Step 5	Generate learning Issues	C6
Step 4	Discuss and Organise Ideas	C4
Step 3	Brainstorming to Identify Explanations	C3
Step 2	Define the Problem	C1
Step 1	Clarify the Terms and Concepts of the Problem Scenario	C1
Problem- Scenario		

Figure 2. PBL 7 Jumps Model

Self-Directed Learning (SDL) at Rawalpindi Medical University (RMU)

What is Self-Directed Learning (SDL)?

Self-Directed Learning (SDL) is a learning approach in which students take responsibility for their own learning. In SDL, students are expected to:

- Identify what they need to learn
- Set learning goals
- Use appropriate learning resources
- Study independently
- Evaluate their own understanding

Faculty members act as facilitators and guides, helping students stay on track and achieve the learning outcomes.

Why is SDL Important in Medical Education?

SDL is a key part of modern medical education because it helps students develop skills needed for **lifelong learning**. SDL is important because it:

- Encourages independent and active learning
- Builds critical thinking and problem-solving skills
- Improves the ability to search and use evidence-based medical information
- Helps students become responsible and reflective learners
- Prepares future doctors to keep learning throughout their careers

Medical knowledge is constantly changing, so SDL helps students stay updated even after graduation.

SDL at RMU (How It is Conducted)

Rawalpindi Medical University (RMU) has formally incorporated SDL into the MBBS curriculum from Second Year to Final Year.

RMU has developed structured curricula of Self-Directed Learning (SDL) across all professional years. These SDL curricula include:

- Approved SDL topics aligned with each module
- Clearly stated learning objectives for every topic
- A wide range of learning resources, including:
 - Textbook chapters
 - Research articles
 - Clinical guidelines
 - Online videos and interactive learning content
 - Resource links shared through official platforms

SDL at RMU is therefore a planned, organized, and curriculum-based learning activity, not just additional reading.

SDL Hours in the MBBS Program

SDL at RMU is implemented longitudinally across all professional years.

- The total SDL contribution is more than 500 hours
- These hours are distributed from Second Year to Final Year MBBS



- The purpose is to gradually develop independent learning skills throughout the program

Assessment of SDL at RMU

At RMU, SDL is not only a learning strategy but also an assessed component of the curriculum.

- Students are provided SDL topics with objectives and learning resources.
- Students study these topics independently.
- To ensure regular engagement, RMU conducts weekly online LMS-based assessments
- These assessments help students:
 - Stay consistent in learning
 - Test their understanding
 - Receive feedback for improvement

Thus, SDL learning progress is continuously monitored through the institutional LMS system.

. Alignment with PM&DC and WFME Standards

SDL at RMU is aligned with national and international standards of medical education.

PM&DC

Pakistan Medical & Dental Council (PM&DC) emphasizes structured teaching, learning strategies, and internal assessment systems within undergraduate medical education.

WFME

World Federation for Medical Education (WFME) standards highlight the importance of:

- Student-centered learning
- Independent learning skills
- Use of diverse learning resources
- Continuous assessment and quality assurance

RMU's structured SDL program supports these global standards.

Practical Sessions/Skill Lab (SKL)

Practical Session/ Skill Lab (SKL)	
Demonstration/ power point presentation 4-5 slide and relevant clinical videos where required	10-15 minutes
Practical work	25-30 minutes
Write/ draw and get it checked by teacher	20-25 minutes
05 mcqs at the end of the practical	10 minutes
At the end of module practical copy will be signed by head of department	
At the end of block the practical copy will be signed by Head of Department Dean Medical education department QEC	

SECTION – III

Themes, Learning Objectives, Teaching Strategies & Tool of Assessments

Contents

- **Horizontally Integrated Basic Sciences (Anatomy, Physiology & Biochemistry)**
- **Large Group Interactive Session:**
 - Anatomy (LGIS)
 - Physiology (LGIS)
 - Biochemistry (LGIS)
- **Small Group Discussions**
 - Anatomy (SGD)
 - Physiology (SGD)
 - Biochemistry (SGD)
- **Self-Directed Topic, Learning Objectives & References**
 - Anatomy (SDL)
 - Physiology (SDL)
 - Biochemistry (SDL)
- **Skill Laboratory**
 - Anatomy
 - Physiology
 - Biochemistry
- **Learning Management System (LMS)**
 - Anatomy (LMS)
 - Physiology (LMS)
 - Biochemistry (LMS)

CVS Module-I – First Year MBBS

Duration of Module (Four Weeks)

Sr No.	Themes	Duration
1.	Chest Pain & Palpitations	1 st Week
2.	Raised Blood Pressure with Edema & Breathlessness	2 nd Week
3.	Exertional Dyspnea & Exercise Intolerance	3 rd Week
4.	Shock, Acute Chest Pain & Circulatory Collapse	4 th Week

Theme 1: A Patient With Chest Pain & Palpitations. (1st Week)

Theme	Rationale	Learning Objectives
A Patient with Chest Pain & Palpitations	Introduction to heart anatomy, cardiac cycle, ECG, heart sounds, coronary circulation, and early ACS concepts integrate basic sciences with the classic presentation of chest pain and awareness of abnormal heart rhythms.	By the end of the session, students should be able to: 1. Explain chest pain and palpitations using an integrated anatomical, physiological, biochemical, and clinical approach. 2. Correlate thoracic wall, mediastinum, heart position, and great vessels with clinical localization of chest pain. 3. Interpret pulse, blood pressure, JVP, heart sounds, ECG, and chest X-ray findings in a patient with palpitations. 4. Explain how exertion, sympathetic stimulation, and altered blood flow can produce palpitations and chest discomfort. 5. Relate cardiac energy metabolism to the increased workload of the heart during exertion. 6. Identify red flags in chest pain requiring urgent medical evaluation. 7. Demonstrate empathetic communication while addressing fear and anxiety in a patient with chest pain.
Case Scenario 1: “When the Heart Races – An Integrated Approach to Chest Pain and Palpitations” A 17-year-old male student, Mr. A, is brought to the emergency department by his father with a history of sudden onset chest discomfort and palpitations for the last two hours. He describes the chest pain as a tight, uncomfortable sensation in the central chest, associated with awareness of rapid heartbeat, mild shortness of breath, sweating, and anxiety. The symptoms started while he was climbing stairs after playing football with his friends. He reports that similar brief episodes of palpitations have occurred twice during the past month, especially after exertion or emotional stress, but they settled spontaneously. He denies fever, cough, trauma to chest, vomiting, or loss of consciousness. There is no history of smoking or drug abuse. His father is worried because a close relative had a “heart problem” at a young age. The patient appears anxious and repeatedly asks: “Doctor, is something wrong with my heart? Can chest pain at my age be dangerous?” On Examination it was observed: 1. Pulse: 112 beats/minute, regular 2. Blood pressure: 118/76 mmHg		

3. Respiratory rate: 20 breaths/minute
4. Temperature: Afebrile
5. Oxygen saturation: 98% on room air
6. Mild sweating and visible anxiety
7. Precordial examination: Apex beat palpable in 5th left intercostal space, mid-clavicular line
8. Heart sounds: S1 and S2 audible, no obvious murmur
9. Chest examination: Clear breath sounds bilaterally
10. JVP: Not raised
11. Peripheral pulses: Present and equal bilaterally

Initial Investigations:

ECG:

1. Sinus tachycardia
2. No acute ST-segment elevation
3. Normal QRS duration

Chest X-ray:

1. Cardiac shadow within normal limits
2. No pneumothorax
3. No mediastinal widening

Basic Laboratory Tests:

1. Hemoglobin: Within normal range
2. Random blood glucose: Normal
3. Serum electrolytes: Within normal limits
4. Cardiac enzymes: Not raised

Entrustable Professional Activities (EPAs)

EPA-1: Obtain relevant history Level 2

EPA-2: Perform basic cardiovascular examination in a patient presenting with chest pain and palpitations. Level 2

EPA-3: Interpret basic clinical findings including pulse, blood pressure, JVP, heart sounds, ECG, and chest X-ray using basic science knowledge and Differentiate common non-life-threatening causes from potentially serious causes of chest pain using an integrated clinical reasoning approach. Level 2

EPAs Detail Annexure-II

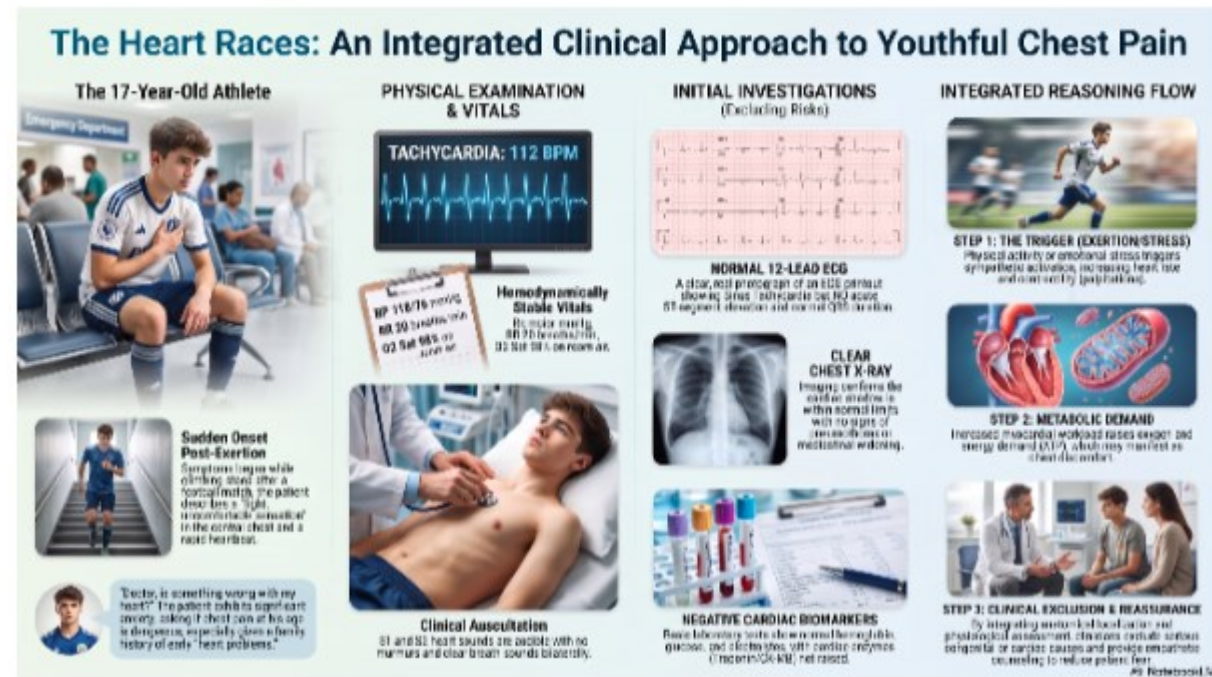
Transdisciplinary Integration — Harden Level 11

In Level 11 integration, this case is not taught separately as “thoracic anatomy,” “cardiac physiology,” “carbohydrate/lipid biochemistry,” or “clinical medicine.”

It is approached as a single patient problem where students connect structure, function, metabolism, clinical presentation, behaviour, and public health relevance.

Students analyze chest pain and palpitations across interconnected domains.

Theme 1 Clinico-Concept Connect (C³6)



Harden Level 11 Transdisciplinary

Specific Learning Objectives

Theory							
Subject	Code	Topic	Learning Objectives At the End of Lecture Students Should Be Able To	Calgary Gauge	Learning Domain	Teaching Strategy	Assessment Tool
General Anatomy							
Anatomy (General)	M5-CVS-A-001	General Anatomy of CVS (General Organization)	• Describe general organization of cardiovascular system	Must know	C2	LGIS	MCQ SAQ VIVA
			• Describe different types of circulations	Must know	C2		
			• Discuss general structural patterns of arteries and veins	Must know	C2		
			• Differentiate between different types of capillaries	Must know	C4		
			• Explain bio - functional importance and location of continuous, fenestrated and sinusoidal capillaries	Must know	C2		
			• Discuss related clinicals	Should know	C3		
			• To understand the Biophysiological aspects	Nice to know	C3		
			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• How to read relevant research article	Nice to know	C3		
	M5-CVS-A-002	General Anatomy of CVS (Classification of vessels)	• Classify arteries on the basis of function and size	Must know	C1	LGIS	MCQ SAQ VIVA
			• Classify veins on the basis of function and size	Must know	C1		
			• Describe differences between arteries and veins	Must know	C2		
			• Analyze different types of anastomosi	Must know	C4		
			• Differentiate between anatomic end arteries and functional end arteries giving example	Must know	C4		
			• Discuss related clinicals	Should know	C3		
			• To understand the Biophysiological aspects	Nice to know	C3		
			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• How to read relevant research article	Nice to know	C3		
Anatomy (Embryology)	M5-CVS-A-006	Development of CVS	• Recall the process of vasculogenesis	Must know	C2	LGIS	MCQ SAQ VIVA
			• Describe venous drainage of embryo	Must know	C2		
			• Enlist derivatives of vitelline veins	Must know	C1		

		(Development of Veins)	• Discuss role cardinal veins	Must know	C2		
			• Describe Development of inferior vena cava	Must know	C2		
			• Relate Various Congenital abnormalities with structural development	Should know	C4		
			• To understand the Biophysiological aspects	Nice to know	C3		
			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• How to read relevant research article	Nice to know	C3		
	M5-CVS-A-007	Development of CVS (Aortic Arches and derivatives)	• Describe development and transformation of aortic arches	Must know	C2	LGIS	MCQ SAQ VIVA
			• Enlist derivatives of 1-6th aortic arches	Must know	C1		
			• Discuss formation of intersegmental arteries	Must know	C2		
			• Describe sources and formation of coronary arteries	Must know	C2		
			• Relate the development of aorta with the Congenital abnormalities	Should know	C4		
			• To understand the Biophysiological aspects	Nice to know	C3		
			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• How to read relevant research article	Nice to know	C3		
	M5-CVS-A-0011	Thoracic Wall / Thoracic Vertebra	• Define thorax	Must know	C1	SGD/ Dissection	MCQ SAQ VIVA
			• Discuss components and shape of thoracic cavity.	Must know	C2		
			• Relate the structural anatomy to the relevant clinical conditions	Must know	C4		
			• Classify Ribs	Must know	C1		
			• Describe ribs (side determination, features, attachments, relations, types and ossification.	Must know	C2		
			• Correlate the clinical conditions	Should know	C3		
			• To understand the Biophysiological aspects of Thoracic wall	Nice to know	C3		
			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		

			• Apply strategic use of AI in health care	Nice to know	C3	SGD/ Dissection	MCQ SAQ VIVA
			• Read relevant research article	Nice to know	C3		
	M5-CVS-A-0012	Mediastinum	• Discuss the boundaries and division of mediastinum	Must know	C2		
			• Enumerate the contents of anterior mediastinum.	Must know	C1		
			• Correlate the clinical conditions	Should know	C3		
			• To understand the Biophysiological aspects of Mediastinum	Nice to know	C3		
			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Map Arch of Aorta, Brachiocephalic artery on SP/Model	Nice to know	P		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• Read relevant research article	Nice to know	C3		
Anatomy (Histology)	M5-CVS-A-0035	Elastic Arteries	• Identify characteristic histological features of tunica intima, tunica media and tunica adventitia of elastic arteries under microscope	Must know	P1	SKL/ Practical	OSPE
			• Illustrate histological structure of elastic artery	Should know	C1		
			• Write two points of identification	Should know	C1		
			• To read relevant research article	Nice to know	C3		
Aantomy (SDL)	M5-CVS-A-0023	Thoracic Wall / Thoracic Vertebra	• Define thorax	ClinicallyOriented Anatomy 6th Edition, Pg no.73,77, 78-79, 84,89,93,95,98,446,454 https://youtu.be/PoA-Uq9w-7s https://youtu.be/Ok8-nwVLysM https://www.sciencedirect.com/science/article/pii/S0161475415000639			
			• Discuss components and shape of thoracic cavity.				
			• Discuss the applied and the related clinicalanatomy				
			• Classify Ribs				
			• Describe ribs (side determination, features, attachments, relations, types and ossification.				
			• Discuss the applied and the related clinical anatomy				
			• How to access HEC digital library				
			• How to read relevant research article				
	M5-CVS-A-0024	Mediastinum	• Discuss the boundaries and division of mediastinum	ClinicallyOriented Anatomy 6th Edition, P no.107,110,118,127,128,132-133,160-168,171 https://youtu.be/oBR9p_UDTuo https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5111324/			
			• Enumerate the contents of anterior mediastinum.				
			• How to access HEC digital library				
			• How to read relevant research article				

Physiology (LGIS)	M5-CVS-P-001	Introduction to CVS	1. Describe scheme of circulation through the heart and body	Must Know	A	- Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Cardiovascular Physiology (Chapter 14, Page 469) - Physiology by Linda S. Costanzo 6th Edition. Cardiovascular Physiology (Chapter 4, Page 117) - Physiological Basis of Medical Practice by Best & Taylor's. 13th Edition. Section 02, (Chapter 05, Page 101)	https://youtu.be/28CYhgirBLA https://training.seer.cancer.gov/anatomy/cardiovascular/#:~:text=The%20cardiovascular%20system%20is%20sometimes,arteries%2C%20veins%2C%20and%20capillaries.	1.C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
	M5-CVS-P-002	Classification of blood vessels & Biophysical considerations	- Enumerate Classification of blood vessels. - Analyze the structure–function relationship of different types of blood vessels.	Must Know	A	- Ganong's Review of Medical Physiology. 25TH Edition. Section 05, Cardiovascular Physiology (Chapter 31, Page 567,571) - Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 15, Page 513) - Physiology by Linda S. Costanzo 6th Edition. Cardiovascular Physiology (Chapter 4, Page 119)	https://youtu.be/ar2UPiGzmU https://training.seer.cancer.gov/anatomy/cardiovascular/blood/classification.html	C1 C4	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

						Physiological Basis of Medical Practice by Best & Taylor's.13thEdition. Section 04 (Chapter 15, Page 183)				
M5-CVS-P-003	Heart Sounds	Describe the four heart sounds and differentiate between 1st and 2nd heart sounds	Must Know	A	- Ganong's Review of Medical Physiology.25THEdition .Section 05, Cardiovascular Physiology (Chapter 30, Page 542) - Textbook of Medical Physiology by Guyton & Hall.14thEdition.Secti on 04. (Chapter 23, Page 283)	https://youtu.be/dBwr2GZCmQM https://www.utmb.edu/pedi_ed/CoreV2/Cardiology/cardiologyV2/cardiologyV23.h tml	C1/C4	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE	
M5-CVS-P-004	Regulation of blood flow	Define and describe Resistance to Blood flow Evaluate the regulation of blood pressure using Poiseuille's law. Describe factors related with Blood viscosity and its role in regulation	Must Know	A	- Ganong's Review of Medical Physiology.25THEdition .Section 05, Cardiovascular Physiology (Chapter 31, Page 575) - Physiological Basis of Medical Practice by Best & Taylor's.13thEdition. Section 02(Chapter 5, Page 107) (Chapter 6,page 110)	https://youtu.be/cocB-M3h9k0 https://journals.physiology.org/doi/full/10.1152/advan.00074.2010	C1 C5 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE	

						Textbook of Medical Physiology by Guyton & Hall. 14th Edition. Section 04. (Chapter 14, Page 173) (Chapter 17, Page 205)			
	M5-CVS-P-0023	Capillary circulation, Concept of vasomotion and starling forces	Justify the significance of Starling forces in maintaining fluid balance. Explain role of starling forces in different pathological conditions	- Ganong's Review of Medical Physiology. 25TH Edition. Section 05, (Chapter 31, Page 577) - Physiology by Linda S. Costanzo 6th Edition. Cardiovascular Physiology (Chapter 4, Page 170) - Physiological Basis of Medical Practice by Best & Taylor's. 13th Edition. Section 02 (Chapter 6, Page 119) - Textbook of Medical Physiology by Guyton & Hall. 14th Edition. Section 04. (Chapter 16, Page 193)	1. https://youtu.be/YNROPnYyltc 2. https://www.osmosis.org/learn/Microcirculation_and_Starling_forces	C5 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE	
Physiology (SKL)	M5-CVS-P-0042	Blood Pressure at rest and during exercise	Define B. P	C1	Skill Lab	OSPE Viva			
			Detail study of apparatus	P					
			How to use apparatus	P					
			Identify changes in blood pressure during exercise	P					
Biochemistry (LGIS)	M5-CVS-B-001	Classification and Biological importance of lipids.	Define lipids and describe their general characteristics.	Should Know	C1	LGIS	MCQ SAQ SEQ VIVA		
			Classify lipids	Must Know	C1				
			Describe the biological importance of lipids	Must Know	C2				
			Correlate the biological functions of lipids with selected physiological and clinical conditions.	Should Know	C3				
			- Apply the strategic use of artificial intelligence in healthcare - Use HEC digital library - Practice principles of bioethics - Understand the curative and preventive health care	Nice to know	C3				

			measures				
	M5-CVS-B-002	Fatty acids	Classify fatty acids	Should Know	C1	LGIS	MCQ SAQ SEQ VIVA
			Describe physical and chemical properties of fatty acids	Should Know	C2		
			Interpret the omega (ω) notation and identify the position of double bonds in fatty acids.	Should Know	C3		
			Analyze dietary fat composition and predict its impact on the lipid profile and cardiovascular risk.	Nice to know	C4		
			- Apply the strategic use of artificial intelligence in healthcare - Use HEC digital library - Practice principles of bioethics - Understand the curative and preventive health care measures	Nice to know	C3		
	M5-CVS-B-008	Introduction and classification of carbohydrates	Classify carbohydrates	Must Know	C2	LGIS	MCQ SAQ SEQ VIVA
			Explain the biological significance of major carbohydrates in humans.	Should Know	C2		
			Correlate the structure and classification of carbohydrates with their physiological functions	Should Know	C3		
			Analyze simple clinical or dietary scenarios to identify the relevant class of carbohydrate	Nice to know	C4		
			- Apply the strategic use of artificial intelligence in healthcare - Use HEC digital library - Practice principles of bioethics - Understand the curative and preventive health care measures	Nice to know	C3		
	M5-CVS-B-009	Isomerism, optical activity and mutarotation	Explain the different types of carbohydrate isomerism, including structural isomerism, stereoisomerism, enantiomers, epimers, and anomers	Must Know	C2	LGIS	MCQ SAQ

			Interpret changes in optical rotation during mutarotation using structural representations of glucose	Should Know	C3		SEQ VIVA
			Analyze the structural differences between glucose, galactose, mannose, and fructose to classify the type of isomerism present.	Nice to know	C4		
			- Apply the strategic use of artificial intelligence in healthcare - Use HEC digital library - Practice principles of bioethics - Understand the curative and preventive health care measures	Nice to know	C3		
Biochemistry (SGD)	M5-CVS-B-0014	Classification of carbohydrates and lipids	Classify commonly encountered dietary carbohydrates and lipids into their appropriate categories based on their chemical structure and composition.	Should Know	C3	SGD	MCQ SAQ SEQ VIVA
			Differentiate various classes of carbohydrates and lipids by comparing their structural features, biological functions, and clinical significance	Should Know	C4		
			- Apply the strategic use of artificial intelligence in healthcare - Use HEC digital library - Practice principles of bioethics - Understand the curative and preventive health care measures	Nice to know	C3		
Biochemistry (SDL)	M5-CVS-B-0017	Clinical Relevance of Carbohydrates	Discuss the clinical significance of stereoisomerism, glycosidic linkages, and reducing properties of carbohydrates	Must Know	- Textbook of Lippincott 8th Edition Chapter No.7 pg 92,95 - Harper’s Illustrated Biochemistry, 32nd Edition, Chapter No. 15 pg 147-155 https://youtu.be/jQi84TnstI4?si=a8Bccm2Kazp3ejBN		
			Relate the chemical properties of selected carbohydrates to their clinical and pharmaceutical applications (e.g., glucose, fructose, lactose, dextran, heparin).	Must Know			
		M5-CVS-B-0020	Clinical importance of lipids	Explain how the chemical structure and physicochemical properties of different classes of lipids determine their biological and clinical significance	Must Know	- Harper’s Illustrated Biochemistry, 32nd Edition, Chapter No.21, Page No: 205-215 https://youtu.be/BVxeeiR7JB0?si=xFF	

			Relate the chemical properties of phospholipids, glycolipids, cholesterol, and essential fatty acids to their clinical importance in health and disease.	Must Know	44vBPghT46rn5		
Biochemistry (SKL)	M5-CVS-B-0024	Acrolein Test and lipid solubility and emulsification	Perform the Acrolein test to detect glycerol in lipid samples and interpret the observed results	Must Know	P	Skill Lab	OSPE
			Demonstrate the solubility of a given lipid in water, alcohol, and chloroform, and interpret the results based on the chemical properties of lipids				
			Demonstrate the emulsification of neutral fats in water using sodium carbonate, soap, and bile salts as emulsifying agents				
Medicine	M5-CVS-Med-002	Overview of acute coronary syndrome	Discuss ACS and its various causes.	C2	LGIS	MCQs	
			Illustrate the clinical presentation of ACS.	C2			
			Explain the workshop to be done in E.R for ACS	C2			
			Discuss the treatment of ACS	C2			
Pediatric	M5-CVS-Peads-001	Congenital Heart Diseases	Define congenital heart disease and explain its general embryological basis.	C2	LGIS	MCQs	
			Classify congenital heart diseases into cyanotic and acyanotic types.	C2			
			Describe the normal development of the heart and the embryological basis of common congenital anomalies.	C2			

Spiral Courses (1st Week)

Family Medicine

Code	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
M5-CVS-FMed-001	Approach to a patient with chest pain	• Describe chest pain	C1	LGIS	MCQs
		• Discuss various causes	C2		
		• Explain the clinical presentation.	C2		
		• Enlist the lab investigations	C2		
		• Decision for referral of patient	C2		

Behavioral Sciences

Code	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
M5-CVS-BS-001	Sociology & Health	• The student should be able to understand sociology & health, social groups, social classes & child rearing practice	C1, C2	LGIS	MCQS

Multidisciplinary (Hardens Level 9) Clinico-Concept Connect (C³6) Sessions for 1st Week

Session	Topic	Department	Educational Relevance	At the End of The Demonstration Student Should Be Able To	Learning Domain	Assessment Tool
Clinico-Concept Connect (C ³ 6) Sessions – I	A Patient with Chest Pain & Palpitations	Anatomy	Understanding thoracic wall, mediastinum, heart position, and great vessels helps students localize chest pain and differentiate cardiac from non-cardiac causes. Knowledge of surface anatomy explains the position of apex beat and auscultation areas. Developmental anatomy helps students understand congenital causes of cardiac symptoms in young patients.	• Describe the anatomical boundaries and contents of the thoracic wall and mediastinum relevant to chest pain.	C3	MCQs SAQ
				• Explain the surface anatomy of the heart and great vessels in relation to clinical examination.	C3	
				• Identify the anatomical position of the apex beat and relate it to cardiovascular assessment.	C3	
				• Describe the general organization of the cardiovascular system.	C3	
				• Explain the development of the venous system and its clinical relevance in congenital cardiovascular disorders.	C3	
		Physiology	Palpitations are explained through increased heart rate and sympathetic stimulation. Chest discomfort may result from increased cardiac workload, altered blood flow, anxiety-induced autonomic activation, or underlying rhythm disturbance. Pulse, JVP, heart sounds, and blood pressure help students connect bedside examination with cardiovascular physiology.	• Explain the basic functional organization of the cardiovascular system.	C3	
				• Classify blood vessels according to their structure and function.	C3	
				• Describe the biophysical principles of pressure, flow, and resistance in circulation.	C3	
				• Explain the physiological basis of palpitations in relation to heart rate, rhythm, and sympathetic stimulation.	C3	
				• Describe the mechanism of heart sounds and relate them to clinical auscultation.	C3	
				• Explain the regulation of blood flow during rest, exertion, and stress.	C3	

		Biochemistry	The heart is a highly energy-dependent organ. During exertion, myocardial oxygen and energy demand increase. Understanding carbohydrates, lipids, and fatty acids helps students appreciate how cardiac muscle obtains energy and why metabolic disturbances can contribute to cardiovascular dysfunction.	Classify carbohydrates and describe their importance in energy metabolism.	C3	
				Classify lipids and explain the biological importance of fatty acids.	C3	
				Explain the role of carbohydrates and lipids as energy sources for cardiac muscle.	C3	
				Relate altered lipid metabolism to future cardiovascular risk.	C4	
				Explain the importance of metabolic balance in maintaining normal cardiac function.	C3	
		Medicine	Although acute coronary syndrome is uncommon in a young patient, chest pain must be approached systematically. Students learn that history, risk factors, examination, ECG, and cardiac enzymes are used to exclude life-threatening causes.	Define chest pain and palpitations as common cardiovascular presenting complaints.	C3	
				Differentiate between cardiac and non-cardiac causes of chest pain.	C3	
				Describe the initial clinical approach to a patient presenting with chest pain.	C3	
				Identify red-flag features suggestive of acute coronary syndrome.	C3	
				Correlate history, examination, ECG, and basic investigations in evaluating chest pain.	C4	
		Pediatrics	In adolescents and young adults, exertional chest pain and palpitations may occasionally indicate congenital or structural heart disease. Students correlate embryological development of aortic arches, great vessels, and heart with possible congenital abnormalities.	Describe common congenital heart diseases presenting with exertional symptoms or palpitations.	C3	
				Explain the relevance of family history in young patients with chest pain or palpitations.	C3	
				Recognize warning signs of serious cardiac disease in children and adolescents.	C3	
				Correlate embryological development of great vessels with congenital cardiovascular abnormalities.	C4	
		Behavioural Sciences		Explain the role of anxiety and emotional stress in chest pain and palpitations.	C3	

			The patient is anxious and fearful of serious heart disease. Students must learn that symptoms are not only biological but also psychological. Proper communication reduces fear while maintaining clinical safety.	• Demonstrate empathetic communication with a patient presenting with frightening cardiovascular symptoms.	C3	
				• Address patient and family concerns regarding chest pain in a young individual.	C4	
				• Differentiate reassurance from dismissal of symptoms during clinical communication.	C3	
		Community Medicine	Even when immediate danger is excluded, the case provides an opportunity to discuss healthy lifestyle, exercise safety, family history, and preventive cardiovascular care.	• Identify modifiable risk factors for cardiovascular disease.	C3	
				• Explain the importance of early health-seeking behaviour for chest pain.	C3	
				• Discuss lifestyle measures for prevention of cardiovascular disease.	C3	
				• Describe the role of community awareness in reducing morbidity from cardiovascular emergencies.	C3	

Theme 2: Raised Blood Pressure with Edema & Breathlessness. (2nd Week)

Theme	Rationale	Learning Objectives
Raised Blood Pressure with Edema & Breathlessness.	Regulation of blood pressure, venous return, Starling forces, edema, antihypertensive drugs, and heart failure converge clinically as hypertension with fluid retention and exertional dyspnea.	By the end of the session, students should be able to: 1. Explain raised blood pressure, edema, and breathlessness through integrated cardiovascular structure and function. 2. Correlate long-standing hypertension with increased afterload, left ventricular hypertrophy, and cardiac dysfunction. 3. Explain the physiological basis of venous return, cardiac output, capillary filtration, and edema formation. 4. Interpret clinical findings including blood pressure, pulse, JVP, heart sounds, basal crepitations, and pitting edema. 5. Relate ECG, chest X-ray, and echocardiographic findings to hypertensive heart disease. 6. Discuss the biochemical and metabolic risk factors contributing to hypertension and cardiovascular disease. 7. Demonstrate effective counselling regarding drug adherence, salt restriction, lifestyle change, and follow-up.
Case Scenario 2: “When Pressure Builds – An Integrated Approach to Hypertension, Edema and Breathlessness” A 48-year-old male, Mr. R, presents to the medical outpatient department with complaints of progressive breathlessness for the last three weeks and swelling of both feet for the last ten days. Initially, he noticed shortness of breath only on climbing stairs, but now he feels breathless even while walking a short distance. He also reports that he needs two pillows at night to sleep comfortably and occasionally wakes up suddenly with difficulty in breathing. He has noticed that his shoes have become tight by evening and swelling is more marked around the ankles. He also complains of fatigue, reduced exercise tolerance, and occasional heaviness in the chest. He has a history of high blood pressure for the last six years but admits that he takes medicines irregularly. He consumes a high-salt diet and has gained weight over the past few years. There is no history of fever, productive cough, known kidney disease, or recent chest trauma. He appears worried and asks: “Doctor, why are my feet swelling and why do I feel breathless? Is my blood pressure damaging my heart?” On Examination it was observed: 1. Patient is overweight and mildly breathless while speaking		

2. Blood pressure: 168/102 mmHg
3. Pulse: 96 beats/minute, regular
4. Respiratory rate: 24 breaths/minute
5. Oxygen saturation: 94% on room air
6. Bilateral pitting pedal edema present up to the ankles
7. Jugular venous pressure: Mildly raised
8. Apex beat: Displaced laterally
9. Heart sounds: S1 and S2 audible, possible S3 gallop
10. Chest examination: Fine basal crepitations bilaterally
11. Abdomen: Mild right hypochondrial fullness, no gross ascites

Investigations:

ECG:

1. Sinus rhythm
2. Features suggestive of left ventricular strain
3. No acute ST-segment elevation

Chest X-ray:

1. Mild cardiomegaly
2. Prominent pulmonary vascular markings
3. Mild basal congestion

Basic Laboratory Tests:

1. Hemoglobin: Within normal range
2. Serum creatinine: Slightly raised
3. Serum electrolytes: Within acceptable range
4. Random blood glucose: Mildly raised
5. Urine routine examination: Trace proteinuria

Echocardiography:

1. Left ventricular hypertrophy

2. Reduced relaxation of left ventricle
3. Mild reduction in ejection efficiency
4. No significant valvular abnormality

Entrustable Professional Activities (EPAs)

EPA-1: Perform basic cardiovascular and respiratory examination in a patient with raised blood pressure, edema, and breathlessness. **Level 2**

EPA-2: Interpret blood pressure, pulse, JVP, heart sounds, edema, ECG, chest X-ray, and basic laboratory findings using integrated basic science knowledge. **Level 2**

EPA-3: Communicate the importance of blood pressure control, medication adherence, salt restriction, and lifestyle modification to the patient in simple language. **Level 2–3**

EPAs Detail Annexure-II

Justification for Harden Level 11

- No subject is taught independently.
- The patient problem drives learning.
- Anatomy, physiology, biochemistry, pathology, medicine, behavioural sciences, and community medicine are integrated around one clinical presentation.
- Students move from blood pressure regulation → cardiac workload → ventricular dysfunction → venous congestion → edema and breathlessness.
- Molecular, structural, functional, clinical, behavioural, and public health dimensions are connected.
- Faculty function as co-facilitators rather than isolated subject lecturers.

Transdisciplinary Integration — Harden Level 11

In Level 11 integration, this case is not taught separately as “**hypertension from medicine,**” “**edema from pathology,**” “**venous return from physiology,**” or “**pericardium from anatomy.**” It is approached as one integrated biological-clinical problem. Students analyze how long-standing raised blood pressure affects vascular resistance, cardiac workload, venous return, capillary filtration, renal function, pulmonary congestion, and patient wellbeing.

Theme 2 Clinico-Concept Connect (C³6)

C4
P3
A4

C4
P4
A4

The Heavy Toll of Pressure: An Integrated Look at Hypertensive Heart Failure

Increased Systemic Afterload
High blood pressure creates resistance that the left ventricle must constantly overcome to circulate blood.

Pulmonary Congestion & Breathlessness
Fluid in the lungs presents as shortness of breath, orthopnea, and fine basal crepitations.

Left Ventricular Hypertrophy
The heart muscle thickens to handle the workload, eventually leading to reduced relaxation and filling.

The Fluid "Backlog"
Reduced pump efficiency causes blood to back up into the pulmonary and systemic venous systems.

Blood Pressure:	158/102 mmHg (Uncontrolled)
Heart Rhythm:	LV Strain (per ECG) & LV Hypertrophy (per Echo)
Oxygen Sat:	94% on room air with fine basal crepitations

Systemic Venous Congestion
Raised Jugular Venous Pressure (JVP)

Bilateral Pitting Edema in the Ankles

Evidence of Cardiac Remodeling
Clinical signs include a laterally displaced apex beat and a detectable S3 gallop.

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Harden Level 11 Transdisciplinary

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Specific Learning Objectives

Subject	Code	Topic	Learning Objectives At the end of lecture students should be able to	Calgary Gauge	Learning Domain	Teaching Strategy	Assessment Tool
Anatomy (Embryology)	M5-CVS-A-008	Development of CVS (Formation, Position and Partitioning of heart tube)	• Discuss establishment of cardiogenin field	Must know	C2	SGD, Skills Lab	MCQ SAQ VIVA OSPE
			• Describe formation and position of heart tube in developing embryo	Must know	C2		
			• Discuss formation of cardiac loop	Must know	C2		
			• Describe development of sinus venosus	Must know	C2		
			• Explain importance of septum spurium	Must know	C2		
			• Describe development of cardiac septa	Must know	C2		
			• Discuss different methods of septum formation	Must know	C2		
			• Explain septum formation in right atrium	Must know	C2		
			• Describe development and differentiation of atria	Must know	C2		
			• Discuss related congenital abnormalities	Should know	C3		
			• To understand the Biophysiological aspects	Nice to know	C3		
			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• How to read relevant research article	Nice to know	C3		
Anatomy (Histology)	M5-CVS-A-003	Histology of CVS (Arteries and Veins)	• Describe general histological structure of arteries and veins	Must know	C2	LGIS	MCQ SAQ VIVA
			• Tabulate histological differences between arterioles, medium sized arteries, and large arteries	Must know	C2		
			• Discuss related clinicals	Should know	C3		
			• To understand the Biophysiological aspects	Nice to know	C3		
			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• How to read relevant research article	Nice to know	C3		
	M5-CVS-A-0036	Muscular Arteries Small Arteries	• identify characteristic histological features of tunica intima, tunica media and tunica adventitia of muscular and small sized arteries under microscope	Must know	P1	SKL/ Practical	OSPE
			• Illustrate histological structure of Muscular and small sized artery	Should know	C1		

Aantomy (Gross)			• Write two points of identification	Should know	C1		
			• Differentiate between three types of arteries on histology slides	Should know	C1		
			• To read relevant research article	Nice to know	C3		
	M5-CVS-A-0013	Pericardium	• Describe the gross features of fibrous pericardium with its blood and nerve supply	Must know	C2	SGD Skills lab	MCQ SAQ VIVA OSPE
			• Describe the gross features of serous pericardium with its blood and nerve supply	Must know	C2		
			• Describe transverse and oblique pericardial sinus	Must know	C2		
			• Describe the Clinical Significance of the Transverse Pericardial Sinus	Should know	C3		
			• Define Pericarditis and Pericardial Effusion	Should know	C1		
			• Correlate the clinical conditions	Should know	C3		
			• To understand the Biophysiological aspects of Pericardium	Nice to know	C3		
			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Map Pericardium on SP/Model	Nice to know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• Read relevant research article	Nice to know	C3		
	M5-CVS-A-0014	Heart (External features)	• Demonstrate Position and orientation of heart.	Must know	P	SGD, Skills lab	MCQ SAQ VIVA OSPE
			• Describe borders and surfaces of the heart.	Must know	C2		
			• Demonstrate the external features of the heart	Must know	C2		
			• Relate the clinical conditions with structural development.	Should know	C3		
			• To understand the Biophysiological aspects of Heart(External Feature)	Nice to know	C3		
			Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• Read relevant research article	Nice to know	C3		
			• Use HEC digital library	Nice to know	C3		
	M5-CVS-A-0015	Heart (Internal features)	• Differentiate between muscular and smooth part.	Must know	C2	SGD, Skills lab	MCQ SAQ VIVA OSPE
			• Identify the various openings, important features in inter-atrial septum.	Must know	C2		
			• Identify S.A node	Must know	C1		

			• Discuss internal features of left atrium, inter atrial septum, mitral valve and pulmonary veins.	Must know	C2		
			• Analyze the significance of modulator band.	Must know	C4		
			• Identify mitral valve, interventricular septum, aortic vestibule, aortic valve.	Must know	C3		
			• Relate the structural development with various clinical conditions	Should know	C4		
			• To understand the Biophysiological aspects of Heart (Internal features)	Nice to know	C3		
			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Map Cardiac valves on SP/Model	Nice to know	P		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• Read relevant research article	Nice to know	C3		
			• Use HEC digital library	Nice to know	C3		
Anatomy (SDL)	M5-CVS-A-0025	Pericardium	• Describe the gross features of fibrous pericardium with its blood and nerve supply	• Clinically Oriented Anatomy 6th Edition, P no.111,128-129,133-134 https://youtu.be/5RMeCgJn730 https://www.sciencedirect.com/science/article/abs/pii/S1054880721000302			
			• Describe the gross features of serous pericardium with its blood and nerve supply				
			• Describe transverse and oblique pericardial sinus				
			• Describe the Clinical Significance of the Transverse Pericardial Sinus				
			• Define Pericarditis and Pericardial Effusion				
			• How to access HEC digital library				
	M5-CVS-A-0026	Heart I External features	• Demonstrate Position and orientation of heart.	• Clinically Oriented Anatomy 6th Edition, P no.129,135-137,144-149,153-159,171-172 https://youtu.be/uhSBFOTwzDQ https://www.ahajournals.org/doi/full/10.1161/JAHA.122.028014			
			• Describe borders and surfaces of the heart.				
			• Demonstrate the external features of the heart				
			• How to access HEC digital library				
			• How to read relevant research article				
	M5-CVS-A-0027	Heart II Internal features	• Differentiate between muscular and smooth part.	• Clinically Oriented Anatomy 6th Edition, P no.129,135-137,144-149,153-159,171-172 https://youtu.be/uhSBFOTwzDQ			
			• Identify the various openings, important features in inter-atrial septum.				
			• Identify S.A node				
			• How to access HEC digital library				

			• How to read relevant research article				https://www.ahajournals.org/doi/full/10.1161/JAHA.122.028014			
	M5-CVS-A-0028	Heart III Clinical Co-Relation	• Discuss internal features of left atrium, inter atrial septum, mitral valve and pulmonary veins.				• ClinicallyOriented Anatomy 6th Edition, P no.129,135-137,144-149,153-159,171-172 https://youtu.be/uhSBFOTwzDQ https://www.ahajournals.org/doi/full/10.1161/JAHA.122.028014			
			• Discuss importance of modulator band.							
			• Identify mitral valve, interventricular septum, aortic vestibule, aortic valve.							
			• How to access HEC digital library							
			• How to read relevant research article							
	M5-CVS-A-0029	Vasculature of heart	• Describe the origin of coronary arteries				• ClinicallyOriented Anatomy 6th Edition, P no.129,135-137,144-149,153-159,171-172 https://youtu.be/uhSBFOTwzDQ https://www.ahajournals.org/doi/full/10.1161/JAHA.122.028475			
			• Identify course branches and distribution of right coronary arteries and left coronary artery,							
			• Discuss the concept of right and left dominance.							
			• Describe the venous drainage of heart.							
			• Discuss the related applied and clinical anatomy							

Physiology (LGIS)	M5-CVS-P-005	Capillary circulation, Concept of vasomotion and starling forces	Justify the significance of Starling forces in maintaining fluid balance. Explain role of starling forces in different pathological conditions	Must Know	A	• Ganong’s Review of Medical Physiology.25THEdition .Section05,(Chapter 31, Page 577) • Physiology by Linda S. Costanzo 6thEdition.Cardiovascular Physiology (Chapter 4,Page 170) • Physiological Basis of Medical Practice by Best & Taylor’s.13thEdition.Section 02(Chapter 6,Page 119) • Textbook of Medical Physiology by Guyton	1. https://youtu.be/YNROPnYy1tc 2. https://www.osmosis.org/learn/Microcirculation_and_Starling_forces	C5 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
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						& Hall.14 th Edition. Section 04. (Chapter 16, Page 193)				
	M5-CVS-P-006	Functions of veins, Venous return and factors affecting venous return	Differentiate between arteries and veins based on their structure and function. Explain Various factors that affect venous return	Must Know	A	- Physiology by Linda S. Costanzo 6th Edition. Cardiovascular Physiology (Chapter 4, Page 158) - Textbook of Medical Physiology by Guyton & Hall. 14th Edition. Section 4. (Chapter 15, Page 188)	1. https://youtu.be/FKJr5uqPv5s 2. https://www.sciencedirect.com/topics/medicine-and-dentistry/venous-return	C4 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
	M5-CVS-P-008	Cardiac output & its control, measurement of cardiac output, pathologically high and low cardiac output	Explain cardiac output Assess the various methods used to measure cardiac output. Explain various factor which help in regulation of heart rate and stroke volume	Must Know	A	- Ganong's Review of Medical Physiology. 25TH Edition. Section 05, (Chapter 30, Page 543) - Human Physiology by Dee Unglaub Silverthorn. 8TH Edition. (Chapter 14, Page 500-507) - Physiology by Linda S. Costanzo 6th Edition. Cardiovascular Physiology (Chapter 4, Page 149, 154-158) - Textbook of Medical Physiology by Guyton & Hall. 14th Edition. Section 04. (Chapter	1. https://youtu.be/WuGMqezV3eo 2. https://teachmeanatomy.com/cardiovascular-system/cardiac-output/	C2 C5 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE

						20, Page 245)((Chapter 22, Page 280)				
	M5-CVS-P-009	Vectorial analysis & arrhythmias I	Describe the principles of vectorial analysis of ECG. Evaluate the vectorial analysis of a normal ECG. Define arrhythmia Distinguish among the different abnormal sinus rhythms.	Must Know	A	- Ganong's Review of Medical Physiology.25THEdition .Section 05(Chapter 29, Page 526) - Physiological Basis of Medical Practice by Best & Taylor's.13thEdition.(Chapter 09,Page 179,180-189) - Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 12, Page 143)((Chapter 13, Page 157)	https://www.brainkart.com/article/Principles-of-Vectorial-Analysis-of-Electrocardiograms_19241/ https://youtu.be/6LrptveKYus https://www.medicalnewstoday.com/articles/8887#definition	C1 C5 C1 C4	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
	M5-CVS-P-0014	Short term regulation of blood pressure	Explain short term regulation of blood pressure Differentiate the central nervous system ischemic response and the Cushing reaction	Must Know	A	- Ganong's Review of Medical Physiology.25THEdition .Section 05(Chapter 32, Page 585,590) - Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 15,Page 517,528) - Physiology by Linda S. Costanzo 6thEdition.Cardiovascul	https://youtu.be/HUfILtkPj1k https://www.sciencedirect.com/topics/nursing-and-health-professions/blood-pressure-regulation https://www.cliffsnotes.com/study-guides/anatomy-and-physiology/the-cardiovascular-	C2 C4	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

						ar Physiology (Chapter 4,Page 163) Physiological Basis of Medical Practice by Best & Taylor's.13thEdition.(Chapter 18,Page 217)	system/control-of-blood-pressure			
	M5-CVS-P-0016	Long term regulation of blood pressure	Explain the role of kidneys in long term regulation of blood pressure	Must Know	A	- Physiology by Linda S. Costanzo 6thEdition.Cardiovascular Physiology (Chapter 4,Page 163) - Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 16,page 282) - Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 19, Page 229)	https://youtu.be/5S9xEpAdAgA https://jps.biomedcentral.com/articles/10.1007/s12576-012-0192-0 https://onlinelibrary.wiley.com/doi/10.1111/j.1440-1681.2005.04205.x	C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Physiology (SGD)	M5-CVS-P-0024	Short term regulation of blood pressure	Explain short term regulation of blood pressure Differentiate the central nervous system ischemic response and the Cushing reaction			- Ganong's Review of Medical Physiology.25THEdition.Section 05(Chapter 32, Page 585,590) - Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 15,Page 517,528) - Physiology by Linda S. Costanzo 6thEdition.Cardiovascular	https://youtu.be/HUf1LtkPj1k https://www.sciencedirect.com/topics/nursing-and-health-professions/blood-pressure-regulation https://www.cliffsnotes.com/study-guides/anatomy-and-physiology/the-cardiovascular-	C2 C4	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE

				Physiology (Chapter 4,Page 163) Physiological Basis of Medical Practice by Best & Taylor’s.13thEdition.(Chapter 18,Page 217)	system/control-of-blood-pressure				
Physiology (SKL)	M5-CVS-P-0043	Examination of arterial pulse and JVP	• Importance of radial pulse & JVP		C1		Skill Lab	OSPE Viva	
			• Procedure		P				
			• Various characteristic of pulse		P, C2				
	M5-CVS-P-0044	ECG	• Detail study of ECG leads		C2		Skill Lab	OSPE Viva	
			• How to apply leads		P				
			• Recording		P				
			• Discussion about normal ECG		P, C2				
			• Clinical importance		C2				
Biochemistry (LGIS)	M5-CVS-B-003	Simple lipids	• Classify simple lipids based on their chemical composition.		Must Know	C2	LGIS	MCQ SAQ SEQ VIVA	
			• Differentiate between fats and oils based on their physical and chemical properties.		Should Know	C2			
			• Describe the biological functions of simple lipids in the human body		Should Know	C2			
			• Apply the knowledge of fatty acid composition to predict and explain the physical properties.		Should Know	C3			
			• Compare the chemical and biological characteristics of fats, oils, and waxes		Nice to know	C4			
			• Evaluate the health implications of excessive intake of simple lipids in relation to obesity and cardiovascular disease.		Nice to know	C5			
			- Apply the strategic use of artificial intelligence in healthcare - Use HEC digital library - Practice principles of bioethics - Understand the curative and preventive health care measures		Nice to know	C3			
	M5-CVS-B-004	Compound lipids	• Classify compound lipids into phospholipids, glycolipids, and lipoproteins		Should Know	C2	LGIS	MCQ SAQ	
			• Discuss structure and functions of compound lipids		Must Know	C2			

		(Phospholipids, glycolipids, lipoproteins)	• Interpret the clinical role of compound lipids	Should Know	C3		SEQ VIVA
			• Analyze the consequences of reduced phospholipid (DPPC) production on alveolar stability, lung compliance, and gas exchange in premature newborns.	Nice to know	C4		
			• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3		
	M5-CVS-B-0010	Monosaccharide	• Classify monosaccharides	Must Know	C2	LGIS	MCQ SAQ SEQ VIVA
			• Describe the chemical properties of monosaccharides.	Must Know	C2		
			• Explain the biological significance of monosaccharides in human metabolism	Should Know	C2		
			• Interpret the clinical role of sorbitol, mannitol, and cardiac glycosides in health and disease.	Nice to know	C4		
			• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3		
	M5-CVS-B-0015	Classification & Properties of Fatty Acids	• Classify fatty acids	Should Know	C2	SGD	MCQ SAQ SEQ VIVA
			• Describe physical and chemical properties of fatty acids	Should Know	C2		
			• Compare different classes of fatty acids and analyze how variations in chain length and degree of saturation affect membrane fluidity, melting point, and susceptibility to oxidation.	Nice to know	C4		
			• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3		

			Explain how the chemical structure and stereochemistry of monosaccharides influence their chemical properties and clinical significance.	Must Know			
			Apply the chemical properties of monosaccharides to explain the principle of common laboratory tests used for carbohydrate identification (e.g., Benedict's, Barfoed's, and Seliwanoff's tests)	Should Know			
Biochemistry (SDL)	M5-CVS-B-0018	Clinical Significance of Monosaccharides	Explain how the chemical structure and stereochemistry of monosaccharides influence their chemical properties and clinical significance.	Must Know	Textbook of Lippincott 8 th Edition Chapter No.7 pg 92,95 Harper's Illustrated Biochemistry, 32 nd Edition, Chapter No. 15 pg 147-155 https://youtu.be/fUKUwADHZt8?si=ARNbLejRCpUC2qnV https://youtu.be/jQi84Tnstl4?si=a8Bcm2Kazp3ejBN		
			Apply the chemical properties of monosaccharides to explain the principle of common laboratory tests used for carbohydrate identification (e.g., Benedict's, Barfoed's, and Seliwanoff's tests)	Should Know			
	M5-CVS-B-0021	Fatty Acids: Essential Molecules for Health and Disease	Explain the classification, structure, and physiological functions of saturated, unsaturated, essential, and non-essential fatty acids.	Must Know	Harper's Illustrated Biochemistry, 32 nd Edition, Chapter No.21, Page No: 205-215 Textbook of Lippincott 8 th Edition, Chapter No: 16, Page NO: 201-203 https://youtu.be/brs2nMubr84?si=uuz0Cy0Rli-ydKVt		
			Analyze the relationship between dietary fatty acid composition and the development of disorders such as cardiovascular disease, obesity, and inflammatory conditions.	Should Know			
Biochemistry (SKL)	M5-CVS-B-0025	Molisch's test	Perform Molisch's test to identify the presence of carbohydrates in a given sample following standard laboratory procedures.	Must Know	P	Skill	OSPE
	M5-CVS-B-0026	Benedict's Test	Perform Benedict's test to detect reducing sugars in a given sample using standard laboratory procedures.	Must Know	P	Skill	OSPE
			Interpret Benedict's test results to identify the presence and approximate concentration of reducing sugars and differentiate reducing from non-reducing sugars.	Should Know			
Gynae & Obs	M5-CVS-OBG-002	Hypertensive disorders in pregnancy (gestational	Define gestational hypertension	C1	LGIS		MCQ
			Describe the spectrum of hypertensive disorders during pregnancy with proper definitions	C2			
			Comprehend pathophysiology of these disorders	C2			

		hypertension, pre-eclampsia)	• Know clinical presentation of hypertensive disorders	C2		
			• Justify relevant laboratory investigations	C2		
			• Understand principles of management	C2		
			• Enlist maternal and fetal complications	C2		
Medicine	M5-CVS-Med-001	Hypertension	• Define Hypertension	C1	LGIS	MCQ
			• Discuss various causes and grades.	C2		
			• Explain the clinical presentation.	C2		
			• Compare between primary and secondary hypertension.	C2		
			• Enlist the lab investigations to be done for hypertension.	C2		
			• Discuss the treatment plan of hypertension.	C2		
Eye	M5-CVS-E-001	Retinal changes in hypertension	• Define hypertensive retinopathy	C1	LGIS	MCQ
			• Describe stages of hypertensive retinopathy	C2		
			• Explain pathophysiology of hypertensive retinopathy	C2		
Pharmacology	M5-CVS-Pharm-001	Clinical Pharmacology Of Antihypertensive	• Classify drugs used for hypertension	C2	LGIS	MCQ
			• Explain the mechanisms of action of different classes of antihypertensive	C2		
			• Explain the mechanisms of action of different classes of antihypertensive	C2		
			• Identify common side effects and contraindications associated with each class of medication	C2		
Pathology	M5-CVS-Patho-001	Edema	• Define edema	C1	LGIS	MCQ
			• Classify edema	C2		
			• Discuss pathophysiology of edema with clinical correlation	C2		

Multidisciplinary (Hardens Level 9) Clinico-Concept Connect (C³6) Sessions for 2nd Week

Session	Topic	Department	Educational Relevance	At the End of The Demonstration Student Should Be Able To	Learning Domain	Assessment Tool
Clinico-Concept Connect (C ³ 6) Sessions – II	Raised Blood Pressure with Edema & Breathlessness.	Anatomy	Long-standing hypertension increases cardiac workload and may lead to cardiac enlargement. Understanding heart position helps explain lateral displacement of apex beat. Knowledge of venous return and great vessels helps students understand raised JVP and systemic venous congestion.	Describe the anatomy of the pericardium and its clinical relevance in cardiac tamponade.	C3	MCQs SAQ
				Explain the gross anatomical features of the heart relevant to cardiac enlargement.	C3	
				Identify the chambers of the heart and relate them to pulmonary and systemic circulation.	C3	
				Describe the anatomical basis of raised JVP and systemic venous congestion.	C3	
				Correlate the position of the apex beat with cardiac enlargement.	C4	
				Explain the embryological basis of aortic arch development and its clinical relevance.	C3	
		Physiology	Raised blood pressure increases afterload on the heart. Over time, this reduces cardiac efficiency and causes venous congestion. Increased venous pressure alters Starling forces, causing fluid movement from capillaries into interstitial spaces, producing pitting edema. Pulmonary congestion explains breathlessness and basal crepitations.	Explain the physiological determinants of blood pressure.	C3	
				Describe venous return and factors affecting venous return.	C3	
				Explain cardiac output and its regulation in normal and pathological states.	C3	
				Describe capillary circulation, vasomotion, and Starling forces.	C3	
				Explain the mechanism of pitting edema in relation to capillary hydrostatic pressure.	C3	
				Interpret basic ECG findings in relation to cardiovascular function.	C3	
				Explain how hypertension increases cardiac workload and contributes to breathlessness.	C3	
		Biochemistry	The myocardium depends heavily on aerobic metabolism and fatty acid oxidation for energy. In hypertension, increased	Describe the classification and biological importance of fatty acids and simple lipids.	C3	
				Explain the role of lipids in vascular health and disease.	C3	
				Relate abnormal lipid metabolism to hypertension, atherosclerosis, and cardiovascular risk.	C3	

			workload raises myocardial energy demand. Dyslipidemia and metabolic imbalance contribute to vascular stiffness, atherosclerosis, and long-term cardiovascular risk.	Explain the energy requirements of cardiac muscle during increased workload.	C3	
				Discuss the biochemical basis of lifestyle-related cardiovascular risk factors such as obesity and dyslipidemia.	C3	
		Pathology	Edema develops when capillary filtration exceeds lymphatic drainage. In this patient, cardiac dysfunction and venous congestion increase hydrostatic pressure, producing pitting pedal edema. Pulmonary congestion causes breathlessness, orthopnea, and basal crepitations.	Define edema and classify its major types.	C3	
				Explain the pathogenesis of pitting edema.	C3	
				Describe the role of increased hydrostatic pressure in edema formation.	C3	
				Correlate pulmonary congestion with breathlessness and basal crepitations.	C3	
				Explain the pathological consequences of long-standing hypertension on the heart, vessels, kidneys, and lungs.	C3	
		Medicine	The patient's uncontrolled hypertension has likely contributed to hypertensive heart disease with early heart failure. Students apply basic science knowledge to clinical assessment, investigation interpretation, and patient counselling.	Define hypertension and describe its clinical significance.	C3	
				Explain the clinical approach to a patient with raised blood pressure, edema, and breathlessness.	C3	
				Correlate uncontrolled hypertension with hypertensive heart disease and heart failure.	C3	
				Interpret ECG, chest X-ray, renal function tests, and echocardiography in suspected hypertensive heart disease.	C4	
				Describe basic principles of management of hypertension and heart failure.	C3	
				Identify warning signs requiring urgent referral or admission.	C3	
		Behavioural Sciences		Identify behavioural factors contributing to poor blood pressure control.	C3	
				Explain the importance of patient adherence in chronic disease management.	C3	
				Demonstrate counselling skills for patients with hypertension and breathlessness.	C3	

			The patient takes antihypertensive medication irregularly and has lifestyle risk factors. Students must explore reasons for non-adherence and communicate without blame, while emphasizing prevention and regular follow-up.	• Address patient fears regarding chronic heart disease with empathy. • Encourage lifestyle modification without blaming the patient.	C3	
					C4	
		Community Medicine	Hypertension is common, silent, and preventable. This case highlights the need for community-level screening, health education, diet modification, exercise, and long-term follow-up to prevent heart failure, stroke, and kidney disease.	• Explain hypertension as a major public health problem.	C3	
				• Describe screening strategies for early detection of hypertension.	C3	
				• Discuss population-level measures for prevention of hypertension.	C3	
				• Explain the role of salt restriction, exercise, weight control, and smoking cessation in cardiovascular prevention.	C3	
				• Describe complications of uncontrolled hypertension at individual and community levels.	C3	

Theme 3: Exertional Dyspnea & Exercise Intolerance. (3rd Week)

Theme	Rationale	Learning Objectives
Exertional Dyspnea & Exercise Intolerance.	Cardiac output regulation, skeletal muscle blood flow, cardiovascular changes during exercise, arrhythmias, and early heart failure integrate into the common symptom of reduced exercise tolerance.	By the end of the session, students should be able to: 1. Explain exertional dyspnea and exercise intolerance through integrated cardiovascular anatomy, physiology, biochemistry, and clinical reasoning. 2. Correlate structural abnormalities of the heart and great vessels with pulse delay, murmur, and exertional symptoms. 3. Explain cardiovascular adaptations during exercise and pregnancy. 4. Interpret clinical findings such as pulse, blood pressure, murmur, apex beat, ECG changes, and echocardiographic findings. 5. Relate anemia, lipid abnormalities, and increased cardiac workload to dyspnea and fatigue. 6. Differentiate physiological breathlessness of pregnancy from warning signs of cardiovascular disease. 7. Demonstrate empathetic counselling for a pregnant patient with cardiac symptoms.
Case Scenario 3: “When Effort Becomes Difficult – An Integrated Approach to Exertional Dyspnea and Exercise Intolerance” A 38-year-old woman, Mrs. S, presents to the outpatient department with complaints of progressive shortness of breath on exertion for the last four months. Initially, she noticed breathlessness only while climbing two flights of stairs, but now she feels tired and breathless even while walking to the nearby market. She reports reduced exercise tolerance, easy fatigability, occasional palpitations, and mild chest heaviness during exertion. She is currently 24 weeks pregnant and states that her symptoms have worsened during pregnancy. She feels more tired than expected and is worried because she is unable to perform routine household activities. She denies fever, cough, wheezing, hemoptysis, or recent respiratory infection. There is no history of known congenital heart disease, but she recalls being told in childhood that she had a “heart murmur,” which was never followed up properly. She appears anxious and asks: “Doctor, why do I become breathless with small effort? Is my heart not able to support my body and my baby?” On Examination it was observed: 1. Patient is conscious, cooperative, and mildly anxious 2. Pulse: 104 beats/minute, regular 3. Blood pressure: 138/86 mmHg in upper limb 4. Respiratory rate: 22 breaths/minute		

5. Oxygen saturation: 96% on room air
6. Mild pallor present
7. JVP: Not raised
8. Apex beat: Slightly forceful
9. Heart sounds: S1 and S2 audible
10. Systolic murmur heard over the precordium
11. Mild pedal edema present
12. Chest examination: Clear breath sounds bilaterally
13. Peripheral pulses: Femoral pulse appears slightly delayed compared with radial pulse

Investigations

Complete Blood Count:

1. Hemoglobin: 10.2 g/dL
2. Mild anemia present

ECG:

1. Sinus tachycardia
2. Features suggestive of left ventricular strain
3. No acute ST elevation

Chest X-ray / Echocardiography:

1. Mild cardiac enlargement
2. Increased left ventricular workload
3. No gross pulmonary pathology
4. Possible narrowing of aortic arch region suggested on further evaluation

Lipid Profile:

1. LDL cholesterol: Borderline raised
2. HDL cholesterol: Low-normal
3. Triglycerides: Mildly raised

Obstetric Assessment:

1. Pregnancy appropriate for gestational age
2. No immediate fetal distress
3. Maternal cardiovascular evaluation advised

Entrustable Professional Activities (EPAs)

EPA-1: Obtain focused history and perform basic cardiovascular examination in a patient with exertional dyspnea and exercise intolerance. **Level 2**

EPA-2: Interpret pulse findings, blood pressure, murmur, ECG, echocardiography, and basic laboratory findings using integrated basic science knowledge. **Level 2**

EPA-3: Communicate risk, need for further evaluation, and follow-up plan empathetically to a pregnant patient and her family. **Level 2–3**

EPAs Detail Annexure-II

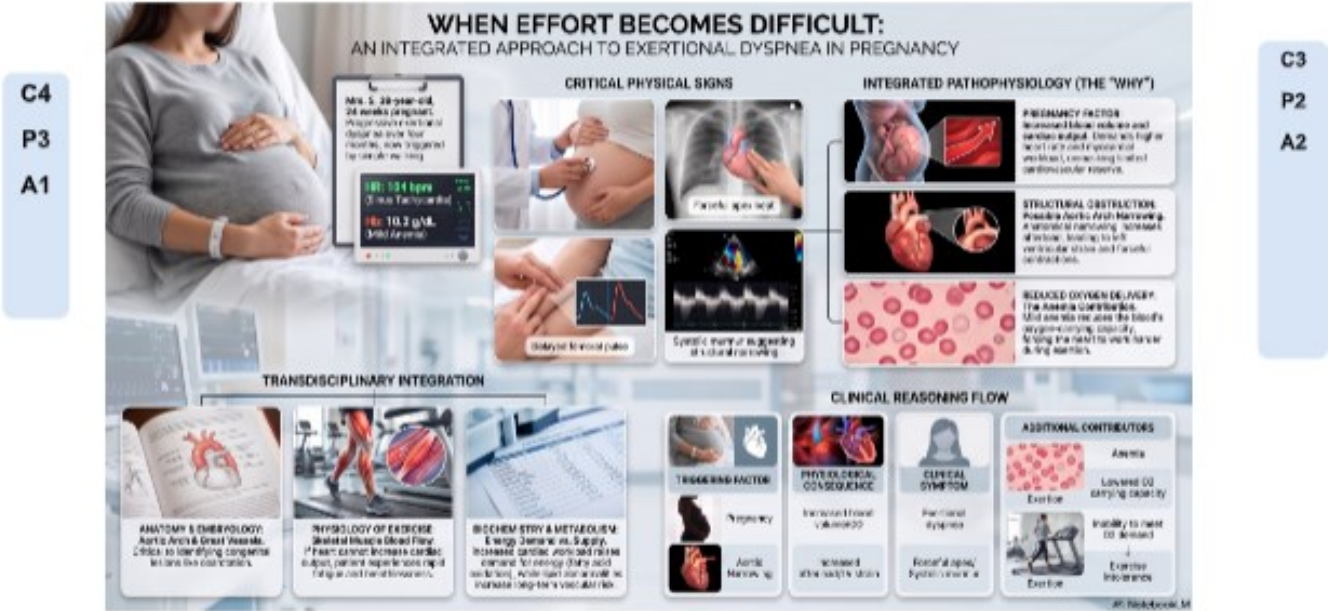
Transdisciplinary Integration — Harden Level 11

In Level 11 integration, this case is not taught separately as “cardiovascular changes in pregnancy,” “coarctation of aorta,” “skeletal muscle blood flow,” “lipid metabolism,” or “ECG changes.”

It is approached as a single patient problem where exertional dyspnea is understood through structural, functional, metabolic, clinical, obstetric, behavioural, and public health dimensions.

Students analyze how pregnancy increases cardiovascular workload, how impaired outflow or vascular narrowing increases afterload, how skeletal muscle blood flow changes during exercise, and how limited cardiac reserve produces breathlessness and exercise intolerance.

Theme 3 Clinico-Concept Connect (C³6)



Harden Level 11 Transdisciplinary

Specific Learning Objectives

Theory							
Subject	Code	Topic	Learning Objectives At The End Of Lecture Students Should Be Able To	Calgary Gauge	Learning Domain	Teaching Strategy	Assessment Tool
Anatomy (Gross)	M5-CVS-A-0016	Heart (Clinical Correlations)	• Coronary Atherosclerosis	Should know	C1	SGD/ Skill Lab	MCQ SAQ VIVA OSPE
			• Myocardial Infarction	Should know	C1		
			• Angina Pectoris	Should know	C1		
			• Coronary Angioplasty	Should know	C1		
			• Correlate the clinical conditions	Should know	C2		
			• To understand the Biophysiological aspects of Heart (Clinical Correlations)	Nice to know	C3		
			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
	M5-CVS-A-0017	Vasculature of heart	• Describe the origin of coronary arteries	Must know	C2	SGD/ Skill Lab	MCQ SAQ VIVA OSPE
			• Identify course branches and distribution of right coronary arteries and left coronary artery,	Must know	C1		
			• Analyze the concept of right and left dominance.	Must know	C4		
			• Describe the venous drainage of heart.	Must know	C2		
			• Relate the clinical conditions with structural development	Should know	C4		
			• To understand the Biophysiological aspects of Vasculature of heart	Nice to know	C3		
			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• Read relevant research article	Nice to know	C3		
	M5-CVS-A-0018	Innervation of Heart	• Describe the formation of superficial and deep cardiac plexus.	Must know	C2	SGD/ Skill Lab	MCQ SAQ VIVA OSPE
			• Correlate the clinical conditions	Should know	C3		
			• To understand the Biophysiological aspects of Innervation of Heart	Nice to know	C3		

			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• Read relevant research article	Nice to know	C3		
	M5-CVS-A-0019	Superior mediastinum (Trachea, Esophagus, Ascending Aorta)	• Enumerate the structure of superior mediastinum	Must know	C1	SGD/ Skill Lab	MCQ SAQ VIVA OSPE
			• Describe great vessels in superior mediastinum	Must know	C2		
			• Relate the clinical conditions with structural development	Should know	C4		
			• To understand the Biophysiological aspects of the superior mediastinum	Nice to know	C3		
			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Map Ascending Aorta on SP/Model	Nice to know	P		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• Read relevant research article	Nice to know	C3		
Anatomy (Embryology)	M5-CVS-A-009	Development of CVS (Formation and partitioning of Ventricles)	• Discuss formation of septum in atrioventricular canal	Must know	C2	LGIS	MCQ SAQ VIVA
			• Describe formation of atrioventricular valves	Must know	C2		
			• Explain septum formation in truncus arteriosus & conus cordis	Must know	C2		
			• Analyze the septum formation in ventricles	Must know	C4		
			• Discuss formation of semilunar valves	Must know	C2		
			• Discuss development of conducting system of heart	Must know	C2		
			• Discuss related Congenital abnormalities	Should know	C3		
			• To understand the Biophysiological aspects	Nice to know	C3		
			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• How to read relevant research article	Nice to know	C3		
Anatomy (Histology)	M5-CVS-A-004	Histology of CVS (Capillaries)	• Differentiate between continuous, fenestrated and sinusoidal capillaries	Must know	C2	LGIS	MCQ SAQ VIVA
			• Enlist bio functions of endothelium	Must know	C2		
			• Discuss related clinicals	Should know	C2		
			• To understand the Biophysiological aspects	Nice to know	C3		

			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• How to Read How to read relevant research article	Should know	C3		
	M5-CVS-A-0037	Large Vein	• Identify characteristic histological features of tunica intima, tunica media and tunica adventitia of large vein under microscope	Must know	P1	SKL/Practical	OSPE
			• Illustrate histological structure of large vein	Should know	C1		
			• Write two points of identification	Should know	C1		
			• To read relevant research article	Nice to know	C3		

Anatomy (SDL)	M5-CVS-A-0030	Innervation of Heart	• Describe the formation of superficial and deep cardiac plexus.	ClinicallyOriented Anatomy 6th Edition, P no.129,135-137,144-149,153-159,171-172 https://youtu.be/uhSBFOTwzDQ https://www.ahajournals.org/doi/full/10.1161/JAHA.122.028932
			• How to access HEC digital library	
			• How to read relevant research article	

Physiology (LGIS)	M5-CVS-P-007	Introduction to ECG & its clinical importance	Enumerate and describe normal components of ECG Draw normal ECG Analyze the method of recording an ECG. Describe Bipolar limb leads. Describe Einthovens law and Einthoven triangle. Describe Chest leads and Augmented unipolar limb leads Describe how to read normal ECG	Must Know	A	- Ganong's Review of Medical Physiology. 25TH Edition. Section 01, Immunity, Infection and Inflammation (Chapter 29, Page 522) - Human Physiology by Dee Unglaub Silverthorn. 8TH Edition. (Chapter 14, Page 491) - Physiological Basis of Medical Practice by Best & Taylor's. 13th Edition. Chapter 09, Page 170)	1. https://youtu.be/SEFhbK8ZCgk 2. https://my.clevelandclinic.org/health/diagnostics/16953-electrocardiogram-ekg	C1 C1 C4 C1 C1 C1 C1 C5	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
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			Describe the principles of vectorial analysis of ECG. Evaluate the vectorial analysis of a normal ECG.			Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 11, Page 135)				
	M5-CVS-P-0010	Cardiac cycle - I, Events of cardiac cycle and its graphical representation	Describe the cardiac cycle in detail Enumerate and explain its events Compare the mechanical events occurring during the cardiac cycle.	Must Know	A	- Ganong's Review of Medical Physiology.25TH Edition. Section 05, (Chapter 30, Page 537) - Human Physiology by Dee Unglaub Silverthorn. 8TH Edition. (Chapter 14, Page 495-500) - Physiology by Linda S. Costanzo 6th Edition. Cardiovascular Physiology (Chapter 4, Page 154) - Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 9, Page 117)	1. https://youtu.be/XbivIaFPoQI 2. https://www.sciencedirect.com/science/article/pii/S0010027721003309 3. https://youtu.be/sLLLOaZ85Lk 4. https://teachmeanatomy.com/cardiocirculatory/cardiocycle-2/cardiocycle/ 5. https://youtu.be/HNkwXZSSsU	C1 C1, C2 C4	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
	M5-CVS-P-0011	Arrhythmias II	Differentiate abnormal rhythms resulting from blocks within the intracardiac conduction pathways Define ectopic beats	Must Know	A	- Ganong's Review of Medical Physiology.25TH Edition. Section 05 (Chapter 29, Page 527) - Physiological Basis of Medical Practice by	1. https://youtu.be/6LrptveKYus 2. https://www.medicalnewstoday.com/articles/8887#definition	C4 C1 C2 C2 C2 C2 C2 C5	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE

			Explain the following with the help of relevant ECGs. Premature contractions. Paroxysmal tachycardia. Ventricular fibrillation. Atrial fibrillation. Atrial flutter. Cardiac arrest. Assess the ECG changes associated with different degrees of heart block Explain atrial and ventricular flutter and fibrillation			Best & Taylor's.13thEdition.(Chapter 09,Page 180-189) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 13, Page 157)		C2		
	M5-CVS-P-0012	Cardiac cycle – II, Functions of ventricles as pumps, aortic pressure curve, regulation of heart pumping	Analyze the various events of the cardiac cycle using a diagram. Explain regulation of heart pumping	Must Know	A	- Ganong's Review of Medical Physiology.25THEdition. Section05,(Chapter 30, Page 537) - Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 495-500) - Physiology by Linda S. Costanzo 6thEdition.Cardiovascular Physiology (Chapter 4,Page 154)	https://youtu.be/dmPtaJxgRQU https://youtu.be/Vl9zo_CzQ9g https://youtu.be/pli2zs8Kekw https://youtu.be/kMJ-US6Qfqc https://youtu.be/qhtAhbyBSfs https://teachmephysiology.com/cardiovascular-system/cardiac-	C4 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

						Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 9, Page 117-126)	cycle-2/cardiac-cycle/			
	M5-CVS-P-0013	ECG changes in myocardial hypertrophies , ischemic heart disease	Compare ECG changes associated with different diseases.	Should Know	B	- Ganong's Review of Medical Physiology.25TH Edition. Section 05(Chapter 29, Page 532) - Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 12,Page 151)	https://youtu.be/SEFhbK8ZCgk https://youtu.be/D0V_aQXtRSw https://www.msmanuals.com/home/heart-and-blood-vessel-disorders/diagnosis-of-heart-and-blood-vessel-disorders/electrocardiography	C4	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Physiology (SGD)	M5-CVS-P-0025	Long term regulation of blood pressure	Explain the role of kidneys in long term regulation of blood pressure			- Physiology by Linda S. Costanzo 6th Edition. Cardiovascular Physiology (Chapter 4,Page 163) - Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 16,page 282) - Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 19, Page 229)	4. https://youtu.be/5S9xEpAdAgA 5. https://jps.biomedcentral.com/articles/10.1007/s12576-012-0192-0 6. https://onlinelibrary.wiley.com/doi/10.1111/j.1440-1681.2005.04205.x	C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Physiology (SKL)	M5-CVS-P-0045	Clinical examination of chest (Heart sounds)		- Inspection - Palpation			P	P	Skill Lab	OSPE

			• Auscultation of all areas of heart	P		Viva	
			• Locate apex beat	P			
Biochemistry (LGIS)	M5-CVS-B-005	Derived lipids	• Describe derived lipids	Should Know	C2	LGIS	MCQ SAQ SEQ VIVA
			• Apply knowledge of derived lipids to explain the biochemical basis of common clinical conditions such as atherosclerosis, gallstone disease, and vitamin deficiencies.	Nice to know	C3		
			• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3		
	M5-CVS-B-006	Cholesterol	• Describe Structure and physical properties of Cholesterol	Should Know	C2	LGIS	MCQ SAQ SEQ VIVA
			• Discuss Chemical properties and functions	Should Know	C2		
			• Interpret clinical findings of hypercholesterolemia	Nice to know	C3		
			• Analyze the relationship between the chemical structure of cholesterol and its physicochemical properties, including solubility and membrane association.	Nice to know	C4		
			• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3		
	M5-CVS-B-0011	Disaccharides	• Define disaccharides and list the common dietary disaccharides	Must Know	C1	LGIS	MCQ SAQ SEQ VIVA
			• Explain the structure, linkages, and reducing or non-reducing properties of common disaccharides.	Must Know	C2		
			• Predict the biochemical consequences of impaired digestion of lactose, sucrose, or maltose in clinical scenarios.	Should Know	C3		
			• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics	Nice to know	C3		

			Understand the curative and preventive health care measures				
	M5-CVS-B-0012	Homopolysaccharides	Explain the structure, glycosidic linkages, functions, and biological significance of major homopolysaccharides	Must Know	C2	LGIS	MCQ SAQ SEQ VIVA
			Compare glycogen, starch, and cellulose with respect to molecular structure, branching pattern, enzymatic digestion, and biological function.	Nice to know	C4		
			Assess the clinical significance of homopolysaccharides in health and disease, including glycogen storage disorders, dietary fiber, and diagnostic applications (e.g., inulin clearance, dextran as a plasma expander).	Nice to know	C5		
			- Apply the strategic use of artificial intelligence in healthcare - Use HEC digital library - Practice principles of bioethics - Understand the curative and preventive health care measures	Nice to know	C3		
Biochemistry (SDL)	M5-CVS-B-0019	Clinical Aspects of Disaccharides and Homopolysaccharides	Differentiate between major dietary disaccharides and homopolysaccharides based on their chemical composition, glycosidic bonds, and structural characteristics.	Must Know	Textbook of Lippincott 8 th Edition Chapter No.7 pg 92,95 Harper’s Illustrated Biochemistry, 32 nd Edition, Chapter No. 15 pg 147-155 https://youtu.be/jQi84TnstI4?si=a8Bcm2Kazp3ejBN https://youtu.be/rQyWJIn1HYE?si=X5E9xiF-zfIMXNK2		
			Relate the chemical structure of disaccharides and homopolysaccharides to common clinical conditions such as lactose intolerance, and glycogen storage disorders.	Should Know			
	M5-CVS-B-0022	Compound Lipids in Health and Disease	Describe the structural components and biological significance of major compound lipids in cell membranes and tissues.	Must Know	Harper’s Illustrated Biochemistry, 32 nd Edition, Chapter No.21, Page No: 205-215 Textbook of Lippincott 8 th Edition, Chapter No: 17, Page NO: 223-225, 231-233 https://youtu.be/Hf_sylfUQZc?si=H5eQaCqKQq49bmq		
			Correlate alterations in the chemical composition of compound lipids with selected physiological and pathological conditions.	Should Know			
	Biochemistry (SKL)	M5-CVS-B-0027	Selivanoffs Test	Perform and interpret Selivanoff's test to differentiate ketose sugars from aldose sugars.	Must Know	P	Skill	OSPE

	M5-CVS-B-0028	Barfoed's Test	Perform and interpret Barfoed's test to differentiate monosaccharides from disaccharides.	Must Know	P	Skill	OSPE
Gynae & Obs	M5-CVS-OBG-001	Cardiovascular changes in pregnancy, common cardiac diseases	Understand physiological changes in cardiovascular system during pregnancy (incl. plasma volume, stroke volume, cardiac output, blood pressure)	C2		LGIS	MCQs
			Know physiological versus pathological symptoms related to CVS	C2			
			Briefly describe clinical presentations of common cardiac diseases during pregnancy (rheumatic heart disease, cardiomyopathy, cardiac failure)	C2			
			The effect of cardiac disease on fetus and the mother	C2			
Medicine	M5-CVS-Med-002	Dyspnea	Define dyspnea and explain its basic clinical meaning.	C2		LGIS	MCQs
			Describe the normal physiology of breathing and understand how it differs from dyspnea.	C2			
			Identify the common causes of dyspnea, including respiratory, cardiac, and other systemic causes.	C2			
			Classify dyspnea according to onset, duration, severity, and precipitating factors.	C2			
Pharmacology	M5-CVS-Pharm-002	Clinical pharmacology of antianginal	Classify antianginal drugs	C2		LGIS	MCQs
			Explain the mechanisms of action of different classes of antianginal	C2			
			Enlist the therapeutic uses of various antianginal drugs	C2			
			Identify common side effects and contraindications associated with each class of medication	C2			

Multidisciplinary (Hardens Level 9) Clinico-Concept Connect (C³6) Sessions for 3rd Week

Session	Topic	Department	Educational Relevance	At the End of The Demonstration Student Should Be Able To	Learning Domain	Assessment Tool
Clinico-Concept Connect (C ³ 6) Sessions – III	Exertional Dyspnea & Exercise Intolerance.	Anatomy	The delayed femoral pulse and exertional symptoms suggest possible structural narrowing of the aorta. Understanding the anatomy of the aortic arch, great vessels, and heart vasculature helps students correlate congenital or structural lesions with clinical findings such as pulse delay, murmur, increased cardiac workload, and exercise intolerance.	• Describe the anatomy of the heart vasculature and its relevance to myocardial perfusion.	C3	MCQs SAQ
				• Explain the anatomical course and branches of the aortic arch.	C3	
				• Describe the anatomical basis of coarctation of aorta and its clinical presentation.	C3	
				• Correlate delayed femoral pulse with narrowing of the aorta.	C4	
				• Explain the innervation of the heart and its relevance to heart rate and cardiac function.	C3	
				• Identify the anatomical basis of systolic murmurs and forceful apex beat.	C3	
		Physiology	During exercise, skeletal muscles require increased blood flow and oxygen delivery. If the heart cannot increase cardiac output adequately, the patient develops breathlessness and fatigue. Pregnancy further increases blood volume, heart rate, and cardiac output, unmasking limited cardiac reserve. Increased afterload can produce ventricular strain and ECG changes.	• Explain the cardiovascular adjustments that occur during exercise.	C3	
				• Describe skeletal muscle blood flow and its regulation during physical activity.	C3	
				• Explain how cardiac output increases during exercise and pregnancy.	C3	
				• Describe short-term and long-term regulation of blood pressure.	C3	
				• Explain how increased afterload affects ventricular work and cardiac performance.	C3	
				• Correlate ECG changes with ventricular strain, hypertrophy, and ischemic changes.	C4	
				• Explain the physiological basis of exercise intolerance in reduced cardiac reserve.	C3	
		Biochemistry	1. Derived lipids 2. Disaccharides and homopolysaccharides	• Describe derived lipids and their biological importance.	C3	
				• Explain the role of lipids in vascular health and atherosclerosis.	C3	
				• Relate dyslipidemia to impaired vascular function and cardiovascular risk.	C3	

			3. Lipid metabolism and cardiovascular risk	• Explain the role of carbohydrates and lipids in energy production during exertion.	C3	
			4. Atherosclerosis	• Describe how increased cardiac workload increases myocardial energy demand.	C3	
			5. Energy metabolism during increased cardiac workload	• Correlate metabolic risk factors with long-term cardiovascular disease prevention.	C4	
		Gynae & Obs	Pregnancy normally increases cardiovascular demand. In a woman with reduced cardiac reserve or structural cardiovascular disease, pregnancy can worsen breathlessness, palpitations, and fatigue. Students learn to recognize when symptoms exceed normal pregnancy changes and require further evaluation	• Describe normal cardiovascular changes during pregnancy.	C3	
				• Explain how pregnancy can worsen pre-existing or undiagnosed heart disease.	C3	
				• Identify warning symptoms in pregnancy, including exertional dyspnea, chest heaviness, syncope, and palpitations.	C3	
				• Discuss the importance of maternal cardiovascular assessment during antenatal care.	C3	
				• Explain the need for multidisciplinary care in pregnant patients with suspected cardiac disease.	C3	
		Pharmacology	1. Clinical pharmacology of antianginal drugs 2. Drug safety considerations in pregnancy 3. Rational use of cardiovascular drugs 4. Importance of avoiding self-medication 5. Basic principles of symptom control and referral	• Classify commonly used antianginal drugs at a basic level.	C3	
				• Explain the general principles of cardiovascular drug use in pregnancy.	C3	
				• Describe why drug safety must be considered for both mother and fetus.	C3	
				• Explain the importance of avoiding unsupervised medication use in pregnancy.	C3	
				• Relate pharmacological management to symptom control, risk reduction, and specialist referral.	C4	
		Medicine	1. Clinical approach to exertional dyspnea	• Take a focused history from a patient presenting with exertional dyspnea.	C3	
				• Differentiate cardiac, respiratory, hematological, and physiological causes of breathlessness.	C3	

			2. Differentiation of cardiac and respiratory causes	Identify red-flag symptoms suggestive of serious cardiovascular disease.	C3	
			3. Recognition of cardiac failure symptoms	Interpret relevant clinical findings including pulse delay, murmur, apex beat, and signs of cardiac strain.	C3	
			4. Interpretation of ECG and echocardiographic findings	Correlate ECG and echocardiographic findings with clinical presentation.	C4	
			5. Risk stratification and referral	Explain the basic clinical approach to suspected heart disease in pregnancy.	C3	
		Community Medicine	This case highlights the need for early screening of heart murmurs, proper antenatal care, and cardiovascular risk assessment. Community-level education can prevent delayed diagnosis and maternal complications.	Explain the importance of early detection of heart disease in women of reproductive age.	C3	
				Discuss the role of antenatal screening in preventing maternal and fetal complications.	C3	
				Identify modifiable cardiovascular risk factors such as diet, inactivity, obesity, and dyslipidemia.	C5	
				Explain lifestyle measures for cardiovascular disease prevention.	C3	
				Describe the public health importance of timely referral for pregnant patients with cardiac symptoms.	C3	
		Behavioural Sciences	The patient is worried about her own health and the baby. Students must communicate findings clearly, show empathy, avoid unnecessary fear, and explain the need for further evaluation in a supportive manner.	Recognize anxiety and fear in a pregnant patient with cardiac symptoms.	C3	
				Communicate clinical concerns in a calm, empathetic, and non-alarming manner.	C3	
				Provide reassurance while emphasizing the need for appropriate evaluation.	C3	
				Involve family members appropriately in counselling and shared decision-making.	C3	
				Demonstrate sensitivity to maternal concerns regarding fetal wellbeing.	C3	

Theme 4: Shock, Acute Chest Pain & Circulatory Collapse. (4th Week)

Theme	Rationale	Learning Objectives
Shock, Acute Chest Pain & Circulatory Collapse.	Coronary occlusion, myocardial infarction, circulatory shock, fetal circulation abnormalities, pharmacology of cardiac failure, and radiology are unified through acute life-threatening cardiovascular presentations.	By the end of the session, students should be able to: 1. Explain acute chest pain and circulatory collapse through integrated cardiovascular structure, function, metabolism, pathology, and clinical reasoning. 2. Correlate coronary artery occlusion with myocardial ischemia, ECG changes, biomarkers, and ventricular dysfunction. 3. Explain the mechanism of cardiogenic shock in relation to reduced cardiac output and tissue hypoperfusion. 4. Interpret clinical signs of shock including hypotension, weak pulse, cold clammy skin, altered consciousness, and reduced urine output. 5. Relate pulmonary congestion and breathlessness to left ventricular failure. 6. Explain the importance of immediate emergency response, CPR awareness, and urgent referral. 7. Demonstrate calm, empathetic communication with a critically ill patient and family.
Case Scenario 4: “When Circulation Fails – An Integrated Approach to Shock, Acute Chest Pain and Circulatory Collapse” A 56-year-old male, Mr. H, is brought to the emergency department by his family with severe central chest pain for the last 45 minutes. The pain started suddenly while he was at home, after climbing stairs. He describes it as crushing, pressure-like pain in the center of the chest, radiating to his left arm and lower jaw. It is associated with profuse sweating, nausea, marked weakness, shortness of breath, and a feeling of impending doom. He has a history of hypertension for eight years and type 2 diabetes mellitus for six years. He is overweight, has a sedentary lifestyle, and takes his medicines irregularly. He also has a history of smoking for many years. His family reports that he became pale, cold, and drowsy on the way to the hospital. On arrival, he appears restless, sweaty, and frightened. He asks in a weak voice: “Doctor, am I having a heart attack? Why do I feel like I am collapsing?” On Examination it was observed: 1. Patient is pale, cold, clammy, and anxious 2. Level of consciousness: Drowsy but arousable 3. Pulse: 124 beats/minute, weak and thready 4. Blood pressure: 82/54 mmHg 5. Respiratory rate: 28 breaths/minute 6. Oxygen saturation: 90% on room air		

7. Capillary refill time: Prolonged
8. Extremities: Cold and sweaty
9. JVP: Mildly raised
10. Apex beat: Difficult to localize
11. Heart sounds: Soft S1 and S2, possible S3
12. Chest examination: Fine basal crepitations
13. Peripheral pulses: Weak
14. Urine output: Reduced according to family history

Investigations

ECG:

1. ST-segment elevation in anterior chest leads
2. Sinus tachycardia
3. Possible evolving acute myocardial infarction

Cardiac Biomarkers:

1. Troponin-I: Raised
2. CK-MB: Raised

Chest X-ray:

1. Mild pulmonary congestion
2. No pneumothorax
3. Cardiac silhouette mildly enlarged

Basic Laboratory Tests:

1. Random blood glucose: Raised
2. Serum creatinine: Mildly raised
3. Serum electrolytes: Mild potassium abnormality
4. Arterial blood gases: Metabolic acidosis with raised lactate
5. Complete blood count: Mild leukocytosis

Echocardiography:

1. Reduced left ventricular contractility
2. Regional wall motion abnormality
3. Reduced ejection fraction
4. Features suggestive of cardiogenic shock

Entrustable Professional Activities (EPAs)

EPA-1: Obtain focused emergency history and identify red flags in a patient with acute chest pain and circulatory collapse. **Level 2**

EPA-2: Perform initial assessment of circulation, pulse, blood pressure, respiratory status, consciousness level, and signs of shock. **Level 2**

EPA-3: Interpret ECG, cardiac biomarkers, chest X-ray, and echocardiography using integrated basic science and clinical knowledge. **Level 2**

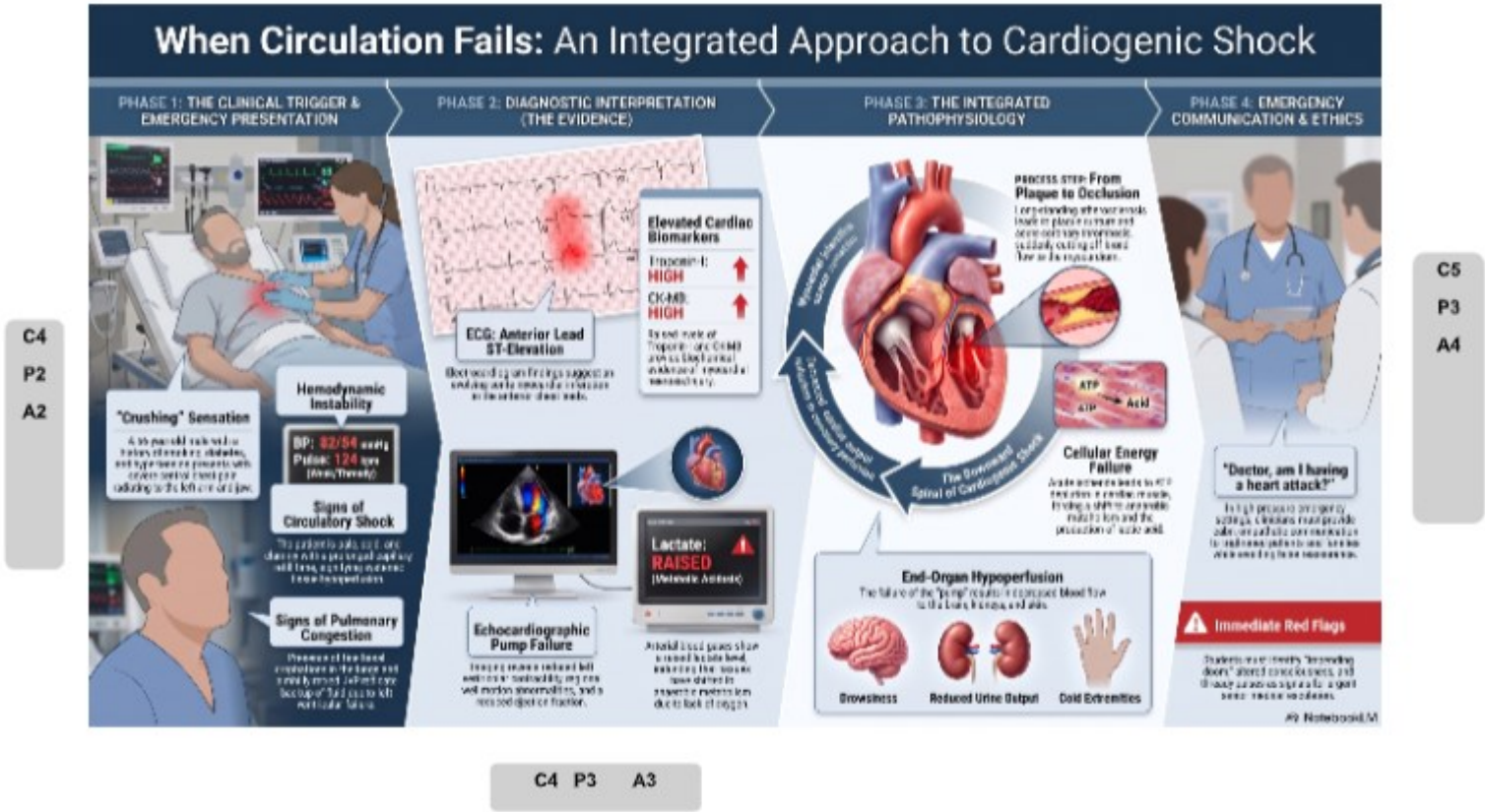
EPA-4: Communicate urgency, risk, and need for emergency management empathetically to the patient and family. **Level 2–3**

[EPAs Detail Annexure-II](#)

Transdisciplinary Integration — Harden Level 11

In Level 11 integration, this case is not taught separately as “myocardial infarction from medicine,” “coronary circulation from physiology,” “posterior mediastinum from anatomy,” “prostaglandins from biochemistry,” or “shock from physiology.” It is approached as a single emergency patient problem where acute coronary occlusion causes myocardial ischemia, pump failure, reduced cardiac output, tissue hypoperfusion, shock, pulmonary congestion, anxiety, and risk of sudden death. Students analyze the case across structural, functional, biochemical, pathological, pharmacological, radiological, clinical, behavioural, and emergency care domains.

Theme 4 Clinico-Concept Connect (C³6)



Harden Level 11 Transdisciplinary

Specific Learning Objectives

Subject	Code	Topic	Learning Objectives At the End of Practical Students Should Be Able To	Calgary Gauge	Learning Domain	Teaching Strategy	Assessment Tool
Anatomy (Gross)	M5-CVS-A-0020	Posterior mediastinum (Boundaries and Structures)	• Identify structures in posterior mediastinum	Must know	C1	SGD	MCQ SAQ VIVA
			• Describe anatomy of structure in Posterior mediastinum	Must know	C2		
			• Identify course, relations and branches of descending aorta.	Must know	C2		
			• Correlate the clinical conditions		C2		
			• To understand the Biophysiological aspects of Posteror mediastinum	Nice to know	C3		
			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Map Descending Thoracic Aorta on SP/Model	Nice to know	P		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• Read relevant research article	Nice to know	C3		
	M5-CVS-A-0021	Posterior mediastinum (Azygos system)	• Describe formation, course and clinical importance of azygos system of veins	Must know	C3	SGD	MCQ SAQ VIVA
			• Describe formation and importance of hemiazygos vein	Must know	C1		
			• Relate the clinical conditions with structural development	Should know	C3		
			• To understand the Biophysiological aspects of Posterior mediastinum	Nice to know	C3		
			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• Read relevant research article	Nice to know	C3		
	M5-CVS-A-0022	Cross sectional Anatomy/ Radiology	• Identify the surfaces present at different levels of cross sections	Must know	P	SGD	MCQ SAQ VIVA
			• Manubriosternal Joint/Angle of Louis	Must know	P		
			• Upper body of Sternum	Must know	P		
			• Section between T 7 , T 8 Thoracic vertebrae	Must know	P		
			• Section between T 8 , T 9 Thoracic vertebrae	Must know	P		
			• Section between T 9 , T 10 Thoracic vertebrae	Must know	P		
			• Relate the clinical conditions with structural development	Should know	C4		
			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		

			• Practice the principles of Bioethics	Nice to know	C3	SGD	MCQ SAQ VIVA
			• Apply strategic use of AI in health care	Nice to know	C3		
			• Read relevant research article	Nice to know	C3		
	M5-CVS-A-0031	Superior mediastinum (Trachea, Esophagus, Ascending Aorta)	• Describe great vessels in superior mediastinum	Should know	C2		
			• How to access HEC digital library	Nice to know	C3		
			• How to read relevant research article	Nice to know	C3		
Anatomy (Embryology)	M5-CVS-A-0010	Development of CVS (Fetal circulation)	• Describe fetal circulation in detail	Nice to know	C2	LGIS	MCQ SAQ VIVA
			• Analyze the role of foramen ovale, ductus arteriosus and ductus venosus in fetal circulation and their fate	Must know	C4		
			• Differentiate between fetal and postnatal circulation	Must know	C4		
			• Discuss related Congenital abnormalities	Should know	C3		
			• To understand the Biophysiological aspects	Nice to know	C3		
			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
Anatomy (Histology)	M5-CVS-A-005	Histology of CVS (Tunics of Heart & Lymphatic System)	• Describe histological details of endocardium, myocardium and epicardium	Must know	C3	LGIS	MCQ SAQ VIVA
			• Tabulate differences between blood capillaries and lymphatic capillaries	Must know	C2		
			• Discuss biophysiological aspects of Heart & Lymphatic System	Must know	C2		
			• To understand the Biophysiological aspects	Should know	C3		
			• Able to focus on provision of curative and preventive health care measures	Nice to know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• Read relevant research article	Nice to know	C3		
	M5-CVS-A-0038	Medium and small sized vein	• Identify characteristic histological features of tunica intima, tunica media and tunica adventitia of medium and small sized vein under microscope	Must know	P1	SKL/ Practical	OSPE
			• Illustrate histological structure of medium and small sized vein	Should know	C1		
			• Write two points of identification Differentiate between three types of veins on histology slides	Should know	C1		
			• To read relevant research article	Nice to know	C3		

	M5-CVS-A-0039	Capillaries	• Classify capillaries on the basis of histological structure and function				C1	SKL/ Practical	OSPE	
			• Enlist sites of continuous, fenestrated and sinusoidal capillaries			Should know	C1			
			• Elaborate characteristic histological features of tunica intima, tunica media and tunica adventitia of capillaries			Should know	C1			
			• Draw and label histological structure of each type of capillaries			Should know	C1			
			• Write two points of identification			Should know	C1			
			• To read relevant research article			Nice to know	C3			
Anatomy (SDL)	M5-CVS-A-0032	Posterior mediastinum I	• Identify structures in posterior mediastinum			ClinicallyOriented Anatomy 6th Edition, P no. 128, 168-172, 179 https://youtu.be/2POILBe2xR4 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9792830/				
			• Describe anatomy of structure in Posterior mediastinum							
			• Identify course, relations and branches of descending aorta.							
			• How to access HEC digital library							
			• How to read relevant research article							
	M5-CVS-A-0033	Posterior mediastinum II	• Describe formation, course and clinical importance of azygos system of veins			ClinicallyOriented Anatomy 6th Edition, P no. 128, 168-172, 179 https://youtu.be/2POILBe2xR4 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9792830/				
			• Describe formation and importance of hemiazygos vein							
			• How to access HEC digital library							
			• How to read relevant research article							
	M5-CVS-A-0034	Surface anatomy / Radiology	• Demonstrate surface projection and radiological aspects of heart, great vessels, trachea, oesphagus, postion of heart valves			ClinicallyOriented Anatomy 6th Edition, P no.129,135-137,144-149,153-159,171-172 https://youtu.be/wqiK-8nZEqk https://pubs.rsna.org/doi/10.1148/ryct.220047				
Physiology (LGIS)	M5-CVS-P-0015	Congestive cardiac failure	Define cardiac failure. Differentiate the types of cardiac failure. Enumerate the causes of cardiac failure and discuss in detail.	Should Know	B	- Ganong’s Review of Medical Physiology.25TH Editio n.Section 05(Chapter 30, Page 538) - Physiological Basis of Medical Practice by Best &	1. https://www.webmd.com/heart-disease/guide/heart-failure 2. https://youtu.be/EDCaFKgtXks 3. https://www.healthline.com/health/c	C1 C4 C1 C4 C4 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

			Distinguish compensated heart failure from decompensated heart failure. Differentiate between Low and high output cardiac failure Define Cardiac reserve.			Taylor's.13 th Edition.(Chapter 22,Page 271)	Congestive-heart-failure			
	M5-CVS-P-0017	Splanchnic circulation, cutaneous circulation	Assess the physiological significance of the anatomy of coronary blood flow. Describe the blood flow in normal state and local control of blood flow	Must Know	A	- Physiology by Linda S. Costanzo 6thEdition.Cardiovascular Physiology (Chapter 4,Page 173) - Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 7,page 146)	1. https://youtu.be/hr6oGuW7mVA 2. https://www.sciencedirect.com/topics/medicine-and-dentistry/splanchnic-blood-flow 3. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2999290/	C5 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
	M5-CVS-P-0018	Skeletal muscle blood flow, Cardiovascular changes during exercise	Compare blood flow regulation in skeletal muscle at rest and during exercise.	Must Know	A	Ganong's Review of Medical Physiology.25 TH Edition. Section 05(Chapter 30, Page 549) Physiology by Linda S. Costanzo 6 th Edition.Cardiovascular Physiology (Chapter 4,Page 178) Physiological Basis of Medical Practice by	1. https://www.sciencedirect.com/topics/medicine-and-dentistry/muscle-blood-flow 2. https://youtu.be/H6Fd8sfE2eQ	C4	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

						Best & Taylor's.13 th Edition. (Chapter 07, Page 148) Textbook of Medical Physiology by Guyton & Hall.14 th Edition.. (Chapter 18, Page 226)(Chapter 21, Page 259)				
	M5-CVS-P-0019	Fetal circulation & cardiac abnormalities in fetal circulation	Describe the fetal circulation Assess the pathophysiology of cardiac abnormalities.	Nice to Know	C	- Ganong's Review of Medical Physiology.25TH Edition. Section 05(Chapter 33, Page 614) - Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 4(Chapter 23, Page 288)	1. https://youtu.be/rYVGjbzmAtg 2. https://www.sciencedirect.com/science/article/abs/pii/S0330620729001511 3. https://myhealth.ucsd.edu/Conditions/Heart/Congenital/90,P01790	C1 C5	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
	M5-CVS-P-0020	Circulatory Shock	Define shock. Describe the physiologic causes of shock. Differentiate the types of shock. Assess the clinical significance of the stages of shock. Describe the following types	Must Know	A	Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 4(Chapter 24, Page 293)	1. https://youtu.be/VZtBOaAMG9w 2. https://my.clevelandclinic.org/health/diseases/17837-cardiogenic-shock	C1 C1 C4 C5 C1 C1 C1 C1 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE

			of shock in detail. Describe Circulatory shock and Hypovolemic shock. Describe Neurogenic shock. Describe Septic shock. Describe Anaphylactic shock							
	M5-CVS-P-0021	Coronary circulation, Atherosclerosis & acute coronary occlusion	Justify the role of coronary vascular anatomy in maintaining normal coronary blood flow. Discuss the control of coronary blood flow	Must Know	A	Ganong's Review of Medical Physiology.25TH Edition. Section 05 (Chapter 33, Page 610) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 15, Page 265) Textbook of Medical Physiology by Guyton & Hall.14th Edition.. (Chapter 21, Page 262)	1. https://www.msdmanuals.com/professional/cardiovascular-disorders/coronary-artery-disease/overview-of-coronary-artery-disease 2. https://youtu.be/WKrVxKJVh00 3. https://www.uptodate.com/contents/mechanisms-of-acute-coronary-syndromes-related-to-atherosclerosis	C5 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
	M5-CVS-P-0022	Cardiac cycle, Events of cardiac cycle and its	Describe the cardiac cycle in detail	Must Know	A	Ganong's Review of Medical	1. https://youtu.be/XbivIaFPoQI	C1 C1/C2 C4		MCQ

		graphical representation, Functions of ventricles as pumps, aortic pressure curve, regulation of heart pumping (SDL)	Enumerate and explain its events Compare the mechanical events occurring during the cardiac cycle.			Physiology.25 TH Edition n.Section05,(Chapter 30, Page 537) - Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 495-500) - Physiology by Linda S. Costanzo 6thEdition.Cardiovascular Physiology (Chapter 4,Page 154) - Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 9, Page 117)	2. https://www.sciencedirect.com/science/article/pii/S0010027721003309 3. https://youtu.be/sLLOaZ85Lk 4. https://teachmeanatomy.com/cardiovascular-system/cardiac-cycle-2/cardiac-cycle/ 5. https://youtu.be/HNkwXZSSsU		LGIS	SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Physiology (SKL)	M5-CVS-P-0046	CPR	• Steps of CPR					P	Skill Lab	OSPE Viva
			• Importance of CPR in daily life					C2, P		
	M5-CVS-P-0047	Triple Response	• Steps of Examination					P	Skill Lab	OSPE Viva
			• Clinical Importance					C2		
Biochemistry (LGIS)	M5-CVS-B-007	Prostaglandins	• Classify prostaglandins				Must Know	C2	LGIS	MCQ SAQ SEQ VIVA
			• Describe the biosynthesis of prostaglandins				Should Know	C2		
			• Describe the physiological functions and clinical significance of prostaglandins				Must Know	C2		
			• Interpret the role of prostaglandins in health and disease				Should Know	C3		
			• Interpret the effects of drugs (e.g., NSAIDs and selective COX-2 inhibitors) on prostaglandin synthesis and their clinical implications.				Nice to know	C3		
			• Compare the biochemical and physiological roles of prostacyclin, and thromboxanes in maintaining vascular homeostasis.				Nice to know	C4		

			• Evaluate the benefits and adverse effects of inhibiting prostaglandin synthesis with NSAIDs in different clinical scenarios	Nice to know	C5		
			• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3		
	M5-CVS-B-0013	Heteropolysaccharides	• Define heteropolysaccharides (glycosaminoglycans) and list their major types	Must Know	C1	LGIS	MCQ SAQ SEQ VIVA
			• Explain the structure, classification, tissue distribution, and biological functions of the major glycosaminoglycans (GAGs)..	Must know	C2		
			• Relate the functions of glycosaminoglycans to the normal physiology of cartilage, skin, synovial fluid, and basement membranes.	Should Know	C3		
			• Compare the structure, functions, and locations of different glycosaminoglycans.	Nice to know	C4		
			• Differentiate between proteoglycans and glycoproteins.	Nice to know	C3		
			• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3		
	M5-CVS-B-0016	Heteropolysaccharides	• Explain Structure, physical and chemical properties of heteropolysaccharides and their biological importance.	Should Know	C2	SGD	MCQ SAQ SEQ VIVA
			• Apply the role of heteropolysaccharides in clinical cases	Nice to Know	C3		
			• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3		

Biochemistry (SDL)	M5-CVS-B-0023	Clinical Role of prostaglandins	Explain the synthesis, classification, and physiological functions of major prostaglandins in the human body.	Must Know	Textbook of Lippincott 8 th Edition Chapter No.17, pg 236-238 Harper's Illustrated Biochemistry, 32 nd Edition, Chapter No.23 pg 234-237 https://youtu.be/g-d9NfUvHTw?si=EN6z2NoZG3DK89pk		
			Relate the mechanism of action of nonsteroidal anti-inflammatory drugs (NSAIDs) to the inhibition of prostaglandin synthesis and their therapeutic effects.	Should Know			
			Apply the knowledge of prostaglandin actions to explain the therapeutic uses of prostaglandin analogues in clinical practice.	Should Know			
Biochemistry (SKL)	M5-CVS-B-0029	Iodine Test	Perform the iodine test using standard laboratory procedures and interpret the results to detect polysaccharides in a given sample	Must Know	P	Skill	OSPE
Medicine	M5-CVS-Med-003	Management of heart failure & shock	Discuss the stepwise management of heart failure.	C2		LGIS	MCQs
			Discuss the management according to various types of shock.	C2		LGIS	MCQS
	M5-CVS-Med-004	Myocardial Infarction (MI)	Define myocardial infarction (MI) and explain its basic clinical significance.	C2		LGIS	MCQS
			Describe the basic anatomy and blood supply of the heart, particularly the coronary arteries.	C2			
			Explain the basic pathophysiology of MI, including coronary artery blockage and myocardial ischemia.	C2			
Radiology	M5-CVS-R-001	Chest radiograph with perspective of cardiovascular system	Interpret normal x-rays of Chest	C2			
			Discuss radiological features of different structures in chest	C2			
Pharmacology	M5-CVS-Pharm-003	Clinical pharmacology of drugs used in cardiac failure	Classify the drugs used in cardiac failure	C2			
			Discuss the mechanism of actions of various drugs used in cardiac failure	C2			
			Enumerate major side effects and contraindications of each class of drugs	C2			

Spiral Courses (4th Week)

Behavioral Sciences

Code	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
M5-CVS-BS-002	Anthropology & Health	The student should be able to understand culture & its influence on health care	C1, C2	LGIS	MCQS

Multidisciplinary (Hardens Level 9) Clinico-Concept Connect (C³6) Sessions for 4th Week

Session	Topic	Department	Educational Relevance	At the End of The Demonstration Student Should Be Able To	Learning Domain	Assessment Tool
Clinico-Concept Connect (C ³ 6) Sessions – IV	Shock, Acute Chest Pain & Circulatory Collapse.	Anatomy	1. Posterior mediastinum and its contents	Describe the anatomical relations of the heart within the mediastinum.	C3	MCQs SAQ
			2. Azygous system of veins	Identify the major contents of the posterior mediastinum.	C3	
			3. Cross-sectional anatomy of thorax	Describe the azygous venous system and its clinical relevance.	C3	
			4. Surface anatomy and radiological anatomy of heart	Explain the coronary arterial supply of the heart and its relation to myocardial infarction.	C3	
			5. Coronary vessels and myocardial blood supply	Correlate cross-sectional thoracic anatomy with chest X-ray findings.	C4	
			6. Anatomical relations of heart, lungs, great vessels, and mediastinum	Relate anatomical localization of chest pain to possible cardiac and non-cardiac causes.	C5	
		Physiology	1. Circulatory shock	Define circulatory shock and describe its major physiological consequences.	C3	
			2. Coronary circulation	Explain how reduced cardiac output leads to hypotension and tissue hypoperfusion.	C3	
			3. Acute coronary occlusion	Describe coronary circulation and the effects of acute coronary occlusion.	C3	
			4. Cardiac output and tissue perfusion	Explain compensatory mechanisms in shock, including tachycardia and peripheral vasoconstriction.	C3	
			5. Short-term regulation of blood pressure	Correlate pulmonary congestion with left ventricular dysfunction.	C4	
			6. Fetal circulation and abnormal cardiovascular circulation	Explain the physiological basis of CPR in maintaining minimal circulation.	C3	
			7. CPR and emergency circulatory support	Relate short-term blood pressure regulation to acute circulatory collapse.	C3	
		Biochemistry	1. Prostaglandins	Explain the role of lipid metabolism in atherosclerosis and coronary artery disease.	C3	
			2. Lipid metabolism and atherosclerosis	Describe the biochemical consequences of myocardial ischemia.	C3	

			3. Energy failure in ischemic myocardium	• Explain ATP depletion and anaerobic metabolism in ischemic cardiac muscle.	C3	
			4. Anaerobic metabolism and lactic acidosis	• Correlate lactic acidosis with tissue hypoperfusion in shock.	C4	
			5. Biochemical markers of myocardial injury	• Describe the significance of cardiac biomarkers in myocardial injury.	C3	
				• Explain the role of prostaglandins and inflammatory mediators in vascular responses and pain.	C3	
		Pathology	1. Atherosclerosis	• Describe the pathogenesis of atherosclerosis.	C3	
			2. Acute coronary thrombosis	• Explain plaque rupture and thrombus formation in acute coronary syndrome.	C3	
			3. Myocardial infarction	• Describe pathological changes in myocardial infarction.	C3	
			4. Coagulative necrosis of myocardium	• Explain how myocardial necrosis leads to pump failure.	C3	
			5. Pulmonary congestion and cardiogenic shock	• Correlate cardiogenic shock with end-organ hypoperfusion.	C4	
			6. End-organ hypoperfusion	• Describe pulmonary congestion secondary to left ventricular failure.	C3	
		Medicine	1. Overview of acute coronary syndrome	• Identify clinical features of acute coronary syndrome.	C3	
			2. Approach to patient with acute chest pain	• Differentiate life-threatening causes of acute chest pain.	C3	
			3. Recognition of cardiogenic shock	• Recognize signs of cardiogenic shock.	C3	
			4. Interpretation of ECG and cardiac biomarkers	• Interpret ECG and cardiac biomarkers in myocardial infarction.	C3	
			5. Emergency stabilization and referral pathway	• Explain the initial emergency approach to a patient with acute chest pain and collapse.	C3	
			6. Management of heart failure and shock	• Describe principles of management of heart failure and shock.	C3	
		Pharmacology	1. Drugs used in cardiac failure	• Classify drugs used in cardiac failure at a basic level.	C3	
			2. Antianginal drugs	• Explain the role of antianginal drugs in reducing myocardial oxygen demand.	C3	

			3. Emergency cardiovascular drugs	• Describe the principles of antiplatelet and anticoagulant therapy in acute coronary syndrome.	C3	
			4. Antiplatelet and anticoagulant principles	• Explain why some cardiovascular drugs must be used cautiously in hypotension and shock.	C3	
			5. Drug safety in hypotension and shock	• Describe the basic role of vasopressors and inotropes in circulatory support.	C3	
			6. Rational use of oxygen, vasopressors, and supportive therapy	• Explain the importance of adherence to long-term cardiovascular medication after recovery.	C3	
		Radiology	1. Chest radiograph with cardiovascular perspective	• Identify cardiomegaly on chest X-ray.	C3	
			2. Cardiomegaly	• Recognize radiological signs of pulmonary congestion.	C3	
			3. Pulmonary congestion	• Explain the role of chest X-ray in evaluating acute chest pain and breathlessness.	C3	
			4. Differential diagnosis of acute chest pain on imaging	• Correlate radiological findings with cardiac failure and shock.	C4	
			5. Cross-sectional correlation of thoracic structures	• Identify when further imaging may be required in acute chest pain.	C3	
		Gynae & Obs	1. Hypertensive disorders in pregnancy	• Describe cardiovascular changes in pregnancy relevant to circulatory stress.	C3	
			2. Cardiovascular changes in pregnancy	• Explain hypertensive disorders in pregnancy as causes of maternal cardiovascular risk.	C3	
			3. Pregnancy-related circulatory stress	• Recognize signs of circulatory collapse in obstetric patients.	C3	
			4. Shock recognition in obstetric patients	• Explain the need for urgent multidisciplinary management in maternal shock.	C3	
			5. Maternal cardiovascular risk	• Relate principles of blood pressure control and shock management to maternal safety.	C4	
		Family Medicine		• Describe the first-contact assessment of a patient with acute chest pain.	C3	

			1. First-contact approach to chest pain 2. Recognition of red flags 3. Urgent referral and emergency response 4. Risk factor identification in primary care 5. Long-term follow-up after cardiovascular events	• Identify red flags requiring immediate emergency referral.	C5	
				• Explain the importance of rapid ECG and transfer to higher-level care.	C3	
				• Counsel patients regarding cardiovascular risk factors.	C5	
				• Plan follow-up for hypertension, diabetes, smoking cessation, and medication adherence after stabilization.	C3	
		Behavioural Sciences	1. Fear and panic during acute chest pain 2. Communication in emergency settings 3. Family counselling 4. Lifestyle behaviour and chronic risk factors 5. Smoking cessation and medication adherence	• Demonstrate calm and empathetic communication during a cardiovascular emergency.	C3	
				• Address fear and panic in the patient and family.	C3	
				• Explain serious illness in simple language without creating unnecessary alarm.	C3	
				• Discuss behaviour change for smoking cessation, diet, exercise, and medication adherence.	C3	
				• Recognize the psychological impact of myocardial infarction and critical illness.	C53	
		Community Medicine	1. Cardiovascular disease as a public health problem 2. Prevention of hypertension, diabetes, obesity, and smoking 3. Early recognition of heart attack symptoms 4. Community CPR awareness	• Explain the burden of cardiovascular disease in the community.	C3	
				• Identify modifiable risk factors for myocardial infarction.	C3	
				• Discuss prevention strategies for hypertension, diabetes, obesity, and smoking.	C4	
				• Explain the importance of public awareness of heart attack symptoms.	C3	
				• Describe the role of CPR training and emergency response systems in reducing mortality.	C3	
				• Discuss secondary prevention and cardiac rehabilitation after myocardial infarction.	C3	

			5. Secondary prevention and rehabilitation			
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Anatomy LGIS Syllabus of Learning Management System (LMS)

Code	Topic	Learning Objectives At the End Of Lecture Students Should Be Able To	Calgary Gauge	Learning Domain	Learning Resource
General Anatomy					
M5-CVS-A-0040	General Organization	• Describe general organization of cardiovascular system	Must know	C2	- Clinically oriented anatomy edition 10 chapter 1 - USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Describe different types of circulations	Must know	C2	
		• Discuss general structural patterns of arteries and veins	Must know	C2	
		• Classify capillaries	Must know	C1	
		• Explain bio - functional importance and location of continuous, fenestrated and sinusoidal capillaries	Must know	C2	
		• Discuss related clinicals		C3	
		• To understand the Biophysiological aspects	Nice to Know	C3	
		• Able to focus on provision of curative and preventive health care measures	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• How to read relevant research article	Nice to Know	C3	
M5-CVS-A-0041	Classification of vessels	• Classify arteries on the basis of function and size	Must know	C1	- Clinically oriented anatomy edition 10 chapter 1 - USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Classify veins on the basis of function and size	Must know	C1	
		• Describe differences between arteries and veins	Must know	C2	
		• Define anastomosis and discuss different types of	Must know	C2	
		• Differentiate between anatomic end arteries and functional end arteries giving example	Must know	C2	
		• Discuss related clinicals	Should know	C3	
		• To understand the Biophysiological aspects	Must know	C3	
		• Able to focus on provision of curative and preventive health care measures	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	

		• Apply strategic use of AI in health care	Nice to Know	C3	
		• How to read relevant research article	Nice to Know	C3	
Histology					
M5-CVS-A-0042	Arteries and Veins	• Describe general histological structure of arteries and veins	Must know	C2	• Junqueira's Basic Histology 18th Edition chapter 11 • USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Tabulate histological differences between arterioles, medium sized arteries, and large arteries	Must know	C2	
		• Discuss related clinicals	Must know	C3	
		• To understand the Biophysiological aspects	Should know	C3	
		• Able to focus on provision of curative and preventive health care measures	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• How to read relevant research article	Nice to Know	C3	
M5-CVS-A-0043	Capillaries	• Differentiate between continuous, fenestrated and sinusoidal capillaries	Must know	C2	• Junqueira's Basic Histology 18th Edition chapter 11 • USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Enlist bio functions of endothelium	Must know	C2	
		• Discuss related clinicals	Should know	C2	
		• To understand the Biophysiological aspects	Must know	C3	
		• Able to focus on provision of curative and preventive health care measures	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• How to Read How to read relevant research article	Nice to Know	C3	
M5-CVS-A-0044	Tunics of Heart & Lymphatic System	• Describe histological details of endocardium, myocardium and epicardium	Must know	C3	• Junqueira's Basic Histology 18th Edition chapter 11 • USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Tabulate differences between blood capillaries and lymphatic capillaries	Must know	C2	
		• Discuss biophysiological aspects of Heart & Lymphatic System	Must know	C2	
		• To understand the Biophysiological aspects	Must know	C3	

		• Able to focus on provision of curative and preventive health care measures	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• How to Read How to read relevant research article	Nice to Know	C3	
Embryology					
M5-CVS-A-0045	Development of Veins	• Recall the process of vasculogenesis	Must know	C2	• The Developing Human 8th edition, chapter 13 • USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Describe venous drainage of embryo	Must know	C2	
		• Enlist derivatives of vitelline veins	Must know	C1	
		• Discuss role cardinal veins	Must know	C2	
		• Describe Development of inferior vena cava	Must know	C2	
		• Discuss related Congenital abnormalities	Should know	C3	
		• To understand the Biophysiological aspects	Must know	C3	
		• Able to focus on provision of curative and preventive health care measures	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• How to read relevant research article	Nice to Know	C3	
M5-CVS-A-0046	Aortic Arches and derivatives	• Describe development and transformation of aortic arches	Must know	C2	• The Developing Human 8th edition, chapter 13 • USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Enlist derivatives of 1-6th aortic arches	Must know	C1	
		• Discuss formation of intersegmental arteries	Must know	C2	
		• Describe sources and formation of coronary arteries	Must know	C2	
		• Discuss development of aorta Related Congenital abnormalities	Should know	C3	
		• To understand the Biophysiological aspects	Must know	C3	
		• Able to focus on provision of curative and preventive health care measures	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• How to read relevant research article	Nice to Know	C3	

M5-CVS-A-0047	Formation, Position and Partitioning of heart tube	• Discuss establishment of cardiogenin field	Must know	C2	- The Developing Human 8th edition, chapter 13 - USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Describe formation and position of heart tube in developing embryo	Must know	C2	
		• Discuss formation of cardiac loop	Must know	C2	
		• Describe development of sinus venosus	Must know	C2	
		• Explain importance of septum spurium	Must know	C2	
		• Describe development of cardiac septa	Must know	C2	
		• Discuss different methods of septum formation	Must know	C2	
		• Explain septum formation in right atrium	Must know	C2	
		• Describe development and differentiation of atria	Must know	C2	
		• Discuss related congenital abnormalities	Should know	C3	
		• To understand the Biophysiological aspects	Must know	C3	
		• Able to focus on provision of curative and preventive health care measures	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• How to read relevant research article	Nice to Know	C3	
M5-CVS-A-0048	Formation and partitioning of Ventricles	• Discuss formation of septum in atrioventricular canal	Must know	C2	- The Developing Human 8th edition, chapter 13 - USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Describe formation of atrioventricular valves	Must know	C2	
		• Explain septum formation in truncusarteriosis & conuscordis	Must know	C2	
		• Describe septum formation in ventricles Discuss formation of semilunar valves	Must know	C2	
		• Discuss development of conducting system of heart	Must know	C2	
		• Discuss related Congenital abnormalities	Should know	C3	
		• To understand the Biophysiological aspects	Must know	C3	
		• Able to focus on provision of curative and preventive health care measures	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• How to read relevant research article	Nice to Know	C3	

M5-CVS-A-0049	Fetal circulation	• Describe fetal circulation in detail	Must know	C2	• The Developing Human 8 th edition, chapter 13
		• Discuss role of foramen ovale, ductus arteriosus and ductus venosis in fetal circulation and their fate	Must know	C2	
		• Differentiate between fetal and postnatal circulation	Must know	C2	
		• Discuss related Congenital abnormalities	Should know	C3	
		• To understand the Biophysiological aspects	Must know	C3	
		• Able to focus on provision of curative and preventive health care measures	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	

Anatomy SGD's Syllabus of Learning Management System (LMS)

Code	Topic	Learning Objectives At the end of lecture students should be able to	Calgary Gauge	Learning Domain	Learning Resources
General Anatomy					
M5-CVS-A-0050	Thoracic Wall / Thoracic Vertebra	• Define thorax	Must know	C1	• Clinically oriented anatomy edition 10 • USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Discuss components and shape of thoracic cavity.	Must know	C2	
		• Discuss the applied and the related clinical anatomy	Must know	C2	
		• Classify Ribs	Must know	C1	
		• Describe ribs (side determination, features, attachments, relations, types and ossification.	Must know	C2	
		• Correlate the clinical conditions	Should know	C3	
		• To understand the Biophysiological aspects of Thoracic wall	Must know	C3	
		• Able to focus on provision of curative and preventive health care measures	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• Read relevant research article	Nice to Know	C3	
M5-CVS-A-0051	Mediastinum	• Discuss the boundaries and division of mediastinum	Must know	C2	• Clinically oriented anatomy edition 10
		• Enumerate the contents of anterior mediastinum.	Must know	C1	
		• Correlate the clinical conditions	Should know	C3	

		• To understand the Biophysiological aspects of Mediastinum • Able to focus on provision of curative and preventive health care measures • Map Arch of Aorta, Brachiocephalic artery on SP/Model • Practice the principles of Bioethics • Apply strategic use of AI in health care • Read relevant research article	Must know	C3	• USMLE Q Bank Step 1 (Volume 1) 2023-2034
			Must know	C3	
			Should know	P	
			Nice to Know	C3	
			Nice to Know	C3	
			Nice to Know	C3	
M5-CVS-A-0052	Pericardium	• Describe the gross features of fibrous pericardium with its blood and nerve supply	Must know	C2	• Clinically oriented anatomy edition 10 • USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Describe the gross features of serous pericardium with its blood and nerve supply	Must know	C2	
		• Describe transverse and oblique pericardial sinus	Must know	C2	
		• Describe the Clinical Significance of the Transverse Pericardial Sinus	Must know	C3	
		• Define Pericarditis and Pericardial Effusion	Must know	C1	
		• Correlate the clinical conditions	Should know	C3	
		• To understand the Biophysiological aspects of Pericardium	Nice to Know	C3	
		• Able to focus on provision of curative and preventive health care measures	Nice to Know	C3	
		• Map Pericardium on SP/Model	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• Read relevant research article	Nice to Know	C3	
M5-CVS-A-0053	Heart (External features)	• Demonstrate Position and orientation of heart.	Should know	P	• Clinically oriented anatomy edition 10 • USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Describe borders and surfaces of the heart.	Must know	C2	
		• Demonstrate the external features of the heart	Must know	C2	
		• Correlate the clinical conditions	Should know	C3	
		• To understand the Biophysiological aspects of Heart(External Feature)	Must know	C3	
		• Able to focus on provision of curative and preventive health care measures	Nice to Know	C3	

		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• Read relevant research article	Nice to Know	C3	
		• Use HEC digital library	Nice to Know	C3	
M5-CVS-A-0054	Heart (Internal features)	• Differentiate between muscular and smooth part.	Nice to Know	C2	• Clinically oriented anatomy edition 10 • USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Identify the various openings, important features in inter-atrial septum.	Must know	C2	
		• Identify S.A node	Must know	C1	
		• Discuss internal features of left atrium, inter atrial septum, mitral valve and pulmonary veins.	Must know	C2	
		• Discuss importance of modulator band.	Must know	C2	
		• Identify mitral valve, interventricular septum, aortic vestibule, aortic valve.	Must know	C3	
		• Correlate the clinical conditions	Should know	C3	
		• To understand the Biophysiological aspects of Heart (Internal features)	Must know	C3	
		• Able to focus on provision of curative and preventive health care measures	Must know	C3	
		• Map Cardiac valves on SP/Model	Should know	P	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• Read relevant research article	Nice to Know	C3	
		• Use HEC digital library	Nice to Know	C3	
M5-CVS-A-0055	Heart (Clinical Correlations)	• Coronary Atherosclerosis	Must know	C1	• Clinically oriented anatomy edition 10 • USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Myocardial Infarction	Must know	C1	
		• Angina Pectoris	Must know	C1	
		• Coronary Angioplasty	Must know	C1	
		• Correlate the clinical conditions	Should know	C2	
		• To understand the Biophysiological aspects of Heart (Clinical Correlations)	Must know	C3	

		• Able to focus on provision of curative and preventive health care measures	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• Read relevant research article	Nice to Know	C3	
M5-CVS-A-0056	Vasculature of heart	• Describe the origin of coronary arteries	Must know	C2	• Clinically oriented anatomy edition 10 • USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Identify course branches and distribution of right coronary arteries and left coronary artery,	Must know	C1	
		• Discuss the concept of right and left dominance.	Must know	C2	
		• Describe the venous drainage of heart.	Must know	C2	
		• Correlate the clinical conditions	Should know	C3	
		• To understand the Biophysiological aspects of Vasculature of heart	Must know	C3	
		• Able to focus on provision of curative and preventive health care measures	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• Read relevant research article	Nice to Know	C3	
M5-CVS-A-0057	Innervation of Heart	• Describe the formation of superficial and deep cardiac plexus.	Must know	C2	• Clinically oriented anatomy edition 10 • USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Correlate the clinical conditions	Should know	C3	
		• To understand the Biophysiological aspects of Innervation of Heart	Must know	C3	
		• Able to focus on provision of curative and preventive health care measures	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• Read relevant research article	Nice to Know	C3	
M5-CVS-A-0058	Superior mediastinum (Trachea,	• Enumerate the structure of superior mediastinum	Must know	C1	• Clinically oriented anatomy edition 10
		• Describe great vessels in superior mediastinum	Must know	C2	
		• Correlate the clinical conditions	Should know	C3	

	Esophagus, Ascending Aorta)	• To understand the Biophysiological aspects of Superior Mediastinum	Must know	C3	• USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Able to focus on provision of curative and preventive health care measures	Must know	C3	
		• Map Ascending Aorta on SP/Model	Should know	P	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• Read relevant research article	Nice to Know	C3	
M5-CVS-A-0059	Posterior mediastinum (Boundaries and Structures)	• Identify structures in posterior mediastinum	Must know	C1	• Clinically oriented anatomy edition 10 • USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Describe anatomy of structure in Posterior mediastinum	Must know	C2	
		• Identify course, relations and branches of descending aorta.	Must know	C2	
		• Correlate the clinical conditions	Should know	C2	
		• To understand the Biophysiological aspects of Posterior mediastinum	Must know	C3	
		• Able to focus on provision of curative and preventive health care measures	Must know	C3	
		• Map Descending Thoracic Aorta on SP/Model	Should know	P	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• Read relevant research article	Nice to Know	C3	
M5-CVS-A-0060	Posterior mediastinum (Azygos system)	• Describe formation, course and clinical importance of azygos system of veins	Must know	C3	• Clinically oriented anatomy edition 10 • USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Describe formation and importance of hemiazygos vein	Must know	C1	
		• Correlate the clinical conditions	Should know	C3	
		• To understand the Biophysiological aspects of Posterior mediastinum	Must know	C3	
		• Able to focus on provision of curative and preventive health care measures	Nice to Know	C3	

		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• Read relevant research article	Nice to Know	C3	
M5-CVS-A-0061	Cross sectional Anatomy/ Radiology	• Identify the surfaces present at different levels of cross sections	Should know	P	• Clinically oriented anatomy edition 10 • USMLE Q Bank Step 1 (Volume 1) 2023-2034
		• Manubriosternal Joint/Angle of Louis	Should know	P	
		• Upper body of Sternum	Should know	P	
		• Section between T 7 , T 8 Thoracic vertebrae	Should know	P	
		• Section between T 8 , T 9 Thoracic vertebrae	Should know	P	
		• Section between T 9 , T 10 Thoracic vertebrae	Should know	P	
		• How to access HEC digital library	Nice to Know	C3	
		• Correlate the clinical conditions	Should know	C2	
		• Able to focus on provision of curative and preventive health care measures	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• Read relevant research article	Nice to Know	C3	

Anatomy SKL Syllabus of Learning Management System (LMS)

Code	Topic	Learning Objectives At The End Of Practical Students Should Be Able To	Calgary Guage	Learning Domain	Learning Resource
Histology					
M5-CVS-A-0062	Elastic Arteries	• identify characteristic histological features of tunica intima, tunica media and tunica adventitia of elastic arteries under microscope	Should know	P1	• DiFiore's Atlas of histology 11 th edition, chapter
		• Illustrate histological structure of elastic artery	Must know	C1	
		• Write two points of identification	Must know	C1	
		• To read relevant research article	Nice to Know	C3	
M5-CVS-A-0063	Muscular Arteries Small Arteries	• identify characteristic histological features of tunica intima, tunica media and tunica adventitia of muscular and small sized arteries under microscope	Should know	P1	• DiFiore's Atlas of histology 11 th edition, chapter
		• Illustrate histological structure of Muscular and small sized artery	Must know	C1	
		• Write two points of identification	Must know	C1	
		• Differentiate between three types of arteries on histology slides	Must know	C1	
		• To read relevant research article	Nice to Know	C3	
M5-CVS-A-0064	Large Vein	• Identify characteristic histological features of tunica intima, tunica media and tunica adventitia of large vein under microscope	Should know	P1	• DiFiore's Atlas of histology 11 th edition, chapter
		• Illustrate histological structure of large vein	Must know	C1	
		• Write two points of identification	Must know	C1	
		• To read relevant research article	Must know	C3	
M5-CVS-A-0065	Medium and small sized vein	• Identify characteristic histological features of tunica intima, tunica media and tunica adventitia of medium and small sized vein under microscope	Should know	P1	• DiFiore's Atlas of histology 11 th edition, chapter

		• Illustrate histological structure of medium and small sized vein	Must know	C1	
		• Write two points of identification Differentiate between three types of veins on histology slides	Must know	C1	
		• To read relevant research article	Nice to Know	C3	
M5-CVS-A-0066	Capillaries	• Classify capillaries on the basis of histological structure and function	Must know	C1	• DiFiore's Atlas of histology 11 th edition, chapter
		• Enlist sites of continuous, fenestrated and sinusoidal capillaries	Must know	C1	
		• Elaborate characteristic histological features of tunica intima, tunica media and tunica adventitia of capillaries	Must know	C1	
		• Draw and label histological structure of each type of capillaries	Must know	C1	
		• Write two points of identification	Must know	C1	
		• To read relevant research article	Nice to Know	C3	

Physiology Syllabus of Learning Management System (LMS)

Code	Topics	Learning Objectives	Calgary Model	Mode of Assessment	Tool of Assessment
M5-CVS-P-0050	Introduction to CVS	Describe scheme of circulation through the heart and body	Nice to know (C)	SDL	MCQs
M5-CVS-P-0051	Classification of blood vessels & Biophysical considerations	- Enumerate Classification of blood vessels. - Explain structure and functions of types of blood vessels	Nice to know (C)	SDL	MCQs
M5-CVS-P-0052	Heart Sounds	Describe four heart sound and differences between 1st and 2nd heart sounds	Must Know (A)	LGIS&SDL	MCQs
M5-CVS-P-0053	Regulation of blood flow	- Define and describe Resistance to Blood flow - Describe regulation of Blood pressure and Poiseuilles law - Describe factors related with Blood viscosity and its role in regulation	Must Know (A)	LGIS&SDL	MCQs
M5-CVS-P-0054	Capillary circulation, Concept of vasomotion and starling forces	- Explain the details of types of starling forces - Explain role of starling forces in different pathological conditions	Must Know (A)	LGIS&SDL	MCQs
M5-CVS-P-0055	Functions of veins, Venous return and factors affecting venous return	- Describe how veins are different from arteries - Explain Various factors that affect venous return	Must Know (A)/ Should know (B)	LGIS&SDL	MCQs
M5-CVS-P-0056	Introduction to ECG & its	Enumerate and describe normal components of ECG	Nice to know (C)	SDL	MCQs

	clinical importance	• Draw normal ECG • Describe the method of recording ECG • Describe the following. Bipolar limb leads. • Describe Einthovians law and Enthovian triangle. • Describe Chest leads and Augmented unipolar limb leads • Describe how to read normal ECG • Describe the principles of vectorial analysis of ECG. • Describe the vectorial analysis of normal ECG			
M5-CVS-P-0057	Cardiac output & its control, measurement of cardiac output, pathologically high and low cardiac output	• Explain cardiac output • Understand various method to measure cardiac output • Explain various factor which help in regulation of heart rate and stroke volume	Must Know (A)/ Should know (B)	LGIS&SDL	MCQs

Biochemistry LGIS Syllabus of Learning Management System (LMS)

Code	Topic	Learning Objectives At the end of lecture students should be able to	Learning Domain	Teaching Strategy	Assessment Tool	References
M5-CVS-B-0030	Definition and Biological importance of lipids.	• Define lipids	C1	LGIS	MCQs SAQs Viva	Textbook of Lippincott 8 th Edition
		• Classify lipids	C2			
		• Describe Biomedical significance of lipids	C2			
		• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know			
M5-CVS-B-0030	Fatty acids	• Classify fatty acids	C1	LGIS	MCQs SAQs Viva	Textbook of Lippincott 8 th Edition
		• Describe physical and chemical properties of fatty acids	C2			
		• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	C3			
M5-CVS-B-0031	Simple lipids	• Elaborate Structure and physical properties of Triglycerides	C2	LGIS	MCQs SAQs Viva	Textbook of Lippincott 8 th Edition
		• Discuss Chemical properties of Triglycerides	C2			
		• Clinical significance	C3			
		• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	C3			
M5-CVS-B-0032	Compound lipids (Phospholipids, glycolipids, lipoproteins)	• Classify compound lipids	C2	LGIS	MCQs SAQs Viva	Textbook of Lippincott 8 th Edition
		• Discuss structure and functions of compound lipids	C2			
		• Interpret the clinical role of compound lipids	C3			
		• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	C3			
M5-CVS-B-0033	Derived lipids	• Describe derived lipids	C2	LGIS	MCQs SAQs Viva	Textbook of Lippincott 8 th Edition
		• Apply the strategic use of artificial intelligence in healthcare	C3			
		• Use HEC digital library				
		• Practice principles of bioethics • Understand the curative and preventive health care measures				

M5-CVS-B-0034	Cholesterol	- Describe Structure and physical properties of Cholesterol - Discuss Chemical properties and functions - Interpret clinical findings of hypercholesterolemia	C2 C2 C3	LGIS	MCQs SAQs Viva	Textbook of Lippincott 8 th Edition
		- Apply the strategic use of artificial intelligence in healthcare - Use HEC digital library - Practice principles of bioethics - Understand the curative and preventive health care measures	C3			
M5-CVS-B-0035	Prostaglandins	- Classify Prostaglandins - Describe functions and clinical significance of Prostaglandins. - Interpret the role of drugs in prostaglandin synthesis	C2 C2 C3	LGIS	MCQs SAQs Viva	Textbook of Lippincott 8 th Edition
		- Apply the strategic use of artificial intelligence in healthcare - Use HEC digital library - Practice principles of bioethics - Understand the curative and preventive health care measures	C3			
M5-CVS-B-0036	Introduction and classification of carbohydrates	- Classify carbohydrates - Explain different types of carbohydrates - Clinical significance	C2 C2 C3	LGIS	MCQs SAQs Viva	Textbook of Lippincott 8 th Edition
		- Apply the strategic use of artificial intelligence in healthcare - Use HEC digital library - Practice principles of bioethics - Understand the curative and preventive health care measures	C3			
M5-CVS-B-0037	Isomerism, optical activity and mutarotation	Discuss Different properties of carbohydrates (Isomerism, optical activity and mutarotation)	C2	LGIS	MCQs SAQs Viva	Textbook of Lippincott 8 th Edition
		- Apply the strategic use of artificial intelligence in healthcare - Use HEC digital library - Practice principles of bioethics - Understand the curative and preventive health care measures	C3			
M5-CVS-B-0038	Monosaccharide	- Classify monosaccharide - Describe chemical properties of monosaccharide - Interpret the clinical role of sorbitol, mannitol and cardiac glycosides	C2 C2 C3	LGIS	MCQs SAQs Viva	Textbook of Lippincott 8 th Edition
		- Apply the strategic use of artificial intelligence in healthcare - Use HEC digital library - Practice principles of bioethics - Understand the curative and preventive health care measures	C3			
M5-CVS-B-0039	Disaccharides	Describe Structure and functions of Individual sugars	C2		MCQs	

		• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	C3	LGIS	SAQs Viva	Textbook of Lippincott 8 th Eidtion
M5-CVS-B-0040	Homopolyssacharides	• Explain Structure, physical and chemical properties of homopolyssacharide and their biological importance.	C2	LGIS	MCQs SAQs Viva	Textbook of Lippincott 8 th Eidtion
		• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	C3			
M5-CVS-B-0041	Heteropolysaccharides	• Explain Structure, physical and chemical properties of heteropolysaccharides and their biological importance. • Apply the role of heteropolysaccharides in clinical cases	C2 C3	LGIS	MCQs SAQs Viva	Textbook of Lippincott 8 th Eidtion
		• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	C3			

Biochemistry SGD Syllabus of Learning Management System (LMS)

Code	Topic	Learning Objectives At the end of lecture students should be able to	Calgary Guage	Learning Domain	Teaching Strategy	Assessment Tool
M5-CVS-B-0042	Introduction of lipids and carbohydrates	• Classify lipids and carbohydrates	Should Know	C1	SGD	MCQs, SAQs Viva
		• Discuss importance of lipids and carbohydrates	Should Know	C2		
		• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3		
M5-CVS-B-0043	Fatty acids	• Classify fatty acids		C1	SGD	MCQs SAQs Viva
		• Describe physical and chemical properties of fatty acids	Should Know	C2		
		• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3		
M5-CVS-B-0044	Cholesterol	• Describe Structure and physical properties of Cholesterol	Should Know	C2	SGD	MCQs SAQs Viva
		• Discuss Chemical properties and functions	Should Know	C2		
		• Interpret clinical findings of hypercholesterolemia	Must Know	C3		
		• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3		
M5-CVS-B-0045	Heteropolysaccharides	• Explain Structure, physical and chemical properties of heteropolysaccharides and their biological importance.	Should Know	C2 C3	SGD	MCQs

		• Apply the role of heteropolysaccharides in clinical cases	Must Know			SAQs Viva
		• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3		

Biochemistry SDL Syllabus of Learning Management System (LMS)

Code	Topic	Learning Objectives At the end of lecture students should be able to	Calgary Guage	References
M5-CVS-B-0046	Clinical importance of carbohydrates	• Define & classify • Explain Pathophysiology & clinical features	Must Know	• Textbook of Lippincott 8th Edition Chapter No.7 pg 92,93 • Text Book of Harper 32 S T Edition chap No. 15 pg 141, 142 ,144 ,147 • https://youtu.be/0N-LS97tTdU
M5-CVS-B-0047	Clinical importance of lipids	• Understand the definition, causes, and basic pathophysiology. • Identify key clinical features and the role of biochemical testing in its diagnosis.	Must Know	• Textbook of Harper 32 S T Edition Chapter No.21 pg 196 • https://youtu.be/tL8z5iEqHkU
M5-CVS-B-0048	Obesity Ear Wax Impaction	• Understand the basic pathophysiology, types, and clinical features. • Identify symptoms and describe the basic methods of removal and prevention.	Must Know	• Textbook of Lippincott 8th Edition Chapter No.15 pg 196 -199 • https://youtu.be/-vNvG7XJpVE
M5-CVS-B-0049	Hypoglycemia	• Understand the definition, causes, and basic pathophysiology	Must Know	• Text Book of Harper 32 S T Edition chap No.15 pg 142, 145 • https://youtu.be/dSPvc8ISWdc
M5-CVS-B-0050	Clinical Importance of homopolysachhrides	• Describe the pathophysiology, types, and genetic basis	Must Know	• Text book of Harper 32 S T Edition Chap No.15 pg 145, 156 • https://youtu.be/0N-LS97tTdU

M5-CVS-B-0051	Hypercholesteremia	Describe the pathophysiology, types, and Biochemical Basis	Must Know	- Textbook of Lippincott 8th Edition Chapter No. 21 pg 199-202 https://youtu.be/3Ig5PQsuiDI
M5-CVS-B-0052	Applied Biochemistry of Heteropolysachrides	Explain the clinical features ,pathophysiology & Biochemical Basis.	Must Know	- Textbook of Lippincott 8th Edition Chapter No. 17 pg 236 - Text Book of Lehninger 7th Edition chap No. 10.3 pg 375,376 https://youtu.be/9UhUEK-1Xh4
M5-CVS-B-0053	Clinical Role of prostaglandins	Understand the definition, causes, and basic pathophysiology	Must Know	- Textbook of Lippincott 8th Edition Chapter No. 14 pg 173-175 - Text Book of Harper 32 S T Edition Chap No.15 pg 147 ,148 https://youtu.be/lkuZa9DDU8Y

Basic and Clinical Sciences (Vertical Integration)

Case Based Learning (CBL)

Subject	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain
Anatomy	• Cardiac Tamponade	Apply basic knowledge of subject to study clinical case.	C3
	• Coarctation of Aorta	Apply basic knowledge of subject to study clinical case.	C3
Physiology	• Pitting edema	Apply basic knowledge of subject to study clinical case.	C3
	• Palpitations / Tachycardia	Apply basic knowledge of subject to study clinical case.	C3
Biochemistry	• Atherosclerosis	Apply basic knowledge of subject to study clinical case.	C3
	• Heparin/dextran	Apply basic knowledge of subject to study clinical case.	C3

SECTION – IV

RMU – 12 Integrated Modular MBBS Curriculum 2026 **Isolation to Beyond Boundaries**

Assessment

RMU – 12 Assessment Framework of Integrated Modular MBBS Curriculum 2026
Isolation to **Beyond Boundaries**

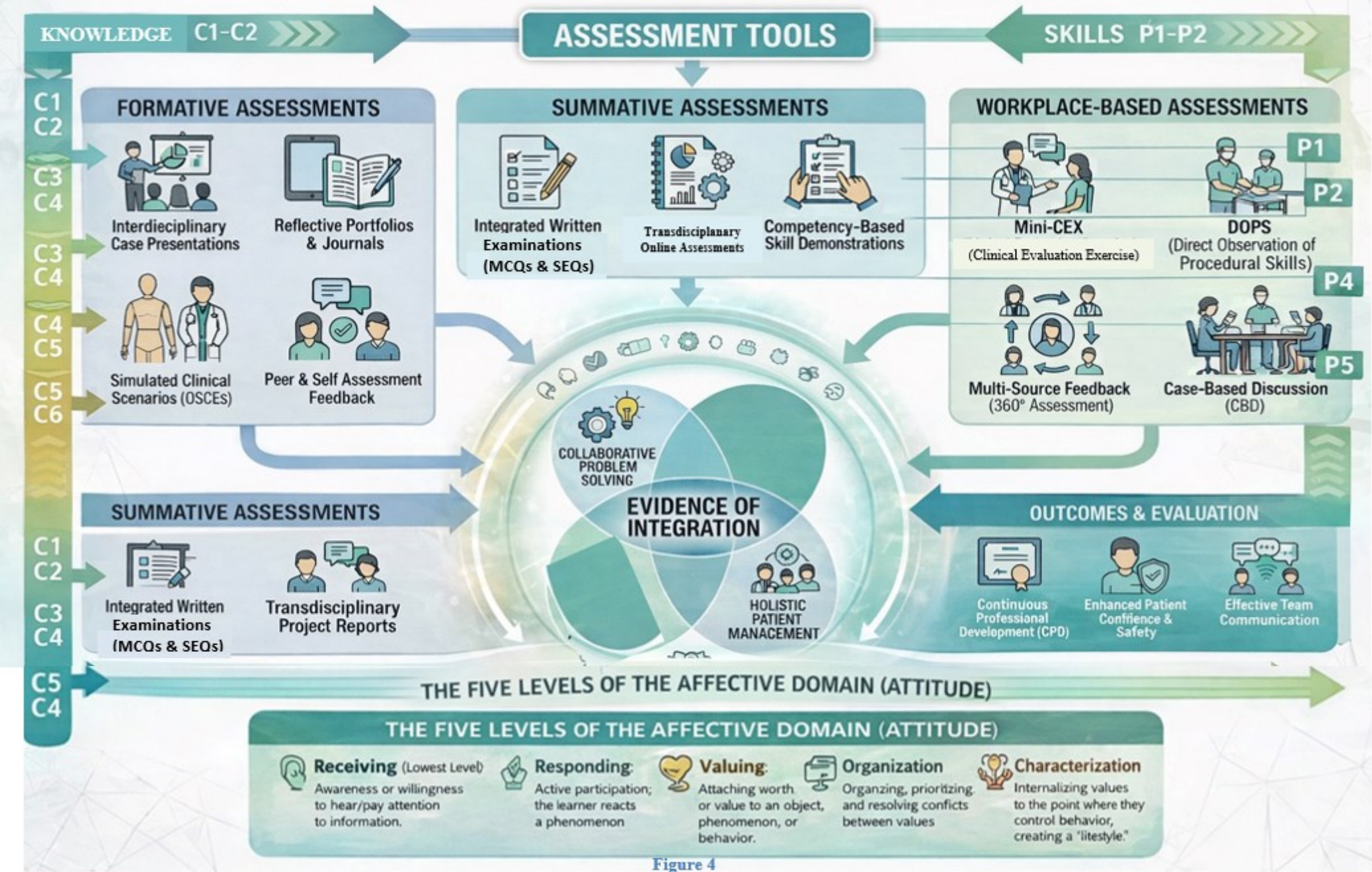


Figure 4

Assessment

Assessment is the systematic basis for making inferences about the learning and development of students. It is the process of defining, selecting, designing, collecting, analyzing, interpreting, and using information to increase students' learning and development.

Assessment Policy

Scope

This policy is applicable to all the students of the MBBS program of RMU for all modes of teaching (on campus/online/any other) from the date of approval by the RMU Academic Council.

1. Guiding principles

- RMU has the responsibility to ensure to all the stakeholders that students have achieved the identified outcomes of the medical degree course.
- Assessment requires a variety of methods; no single method can completely ensure that the requisite competence level has been achieved. Hence each assessment instrument must be selected based on its utility index.
- Feedback, ensuring that the feedback loop is closed, should be provided to students following all assessments to ensure that students identify gaps in their learning and faculty can review future curricular and assessment content.
- The quality of the entire assessment including confidentiality of the assessment process must be ensured.
- The assessment process should be clear and transparent so that students know in advance the expectations (from students) and consequences of the assessment.
- Details of the conduct of examinations are available in the Examination policy document.

2. Purposes of Assessment.

- To ensure appropriate competence has been achieved.
- Feedback to students regarding their readiness and deficiencies
- Feedback to faculty to evaluate the effectiveness of the teaching program.

3. Forms of assessments

3.1 Formative Assessment

A formative assessment refers to a low-stakes assessment that does not normally contribute towards a student's final grade. Assessment for learning is carried out throughout modules and clerkships using various strategies (at the discretion of module coordinators and clerkship directors' feedback. Formative assessment is conducted at both mid-module and end-module stages for clinical lectures and joint multidisciplinary sessions. These assessments are carried out through an on-campus online assessment platform to monitor students' ongoing learning and progress.

3.2 Summative Assessment

A summative assessment is performed at the end of a unit that allows a teacher to measure a student's understanding, typically against a standardized criterion. These Assessment includes End of Module Assessment (EMA), End of Block Assessment (EBA), Pre- Annual Assessment (PAA) and Annual Professional Assessment (APA). Each Assessment comprises of theory component and a practical component.

3.2.1 Components of Assessment

- Cognitive competence is tested in the theory component using the following tool of assessment
 - USMLE/ PLAB Type / Multiple Choice Questions (MCQs)
 - USMLE/ PLAB Type / Extended Match Questions (EMQ)
 - Short Answer Questions (SAQs)
 - Short Essay Questions (SEQs)
- Competence in psychomotor and affect domains is tested in practical component using the following tools of assessment
 - Audio Visual OSPE (AVOSPE): This comprises of stations using PowerPoint slides with images animations and videos
 - Laboratory OSPE (Lab OSPE): This comprises of stations focused on practical (hands on performance) components from core subject areas
 - Integrated OSPE (I OSPE): This comprises of stations, from each core subject, emphasizing horizontal and vertical integration
 - Objective Structured Clinical Examinations (OSCE): This comprises of stations, dedicated to Early Clinical Exposure (ECE), Simulated Patients (SP), models, ALPHA and clinical component of core subjects
 - Objective Structured Viva Examinations (OSVE): This comprises of table viva for each core subject. Students will be evaluated by internal and external examiner using a structured marking rubric, with each viva

3.2.2 End of Module Assessment (EMA)

- End of module assessments will be conducted at the end of each module.
- The module teams will be responsible for the assessment plan including assessment strategies, timings, and other essentials

3.2.3 End of Block Assessment (EBA)

- End of block assessments will be conducted at the end of each block.
- The block teams will be responsible for the assessment plan including assessment strategies, timings, and other essentials
- 85% attendance in each subject will be mandatory
- Student must pass in all LMS, mid module assessments to appear in EBA
- There will be no remedial classes for attendance compensation
- There will be no remedial of assessment in case of poor academic performance

3.2.4 Weekly LMS Based Online Assessment

- Weekly assessment of Large Group Interactive Session (LGIS) and Self-Directed Learning (SDL) Sessions will be conducted on LMS (learning management system). The LMS result will be shared by module coordinator and DME through vice chancellor on weekly basis

Table of Specification (TOS) For Module & Block Examination for First Year MBBS

Domains: C-Core Subject (70%) Levels C1-C2, HV- Horizontal & Vertical Integration (20%) Levels C2-C3, S- Spiral Integration (10%) Levels C2-C3																																		
End of Module Assessment	Subject	Theory (Cognitive) Assessment																			Practical (Skill & Attitude) Assessment										Grand Total	Total Time of Module Assessment		
		MCQs					EMQs			SAQs					SEQs				Marks	Total Marks Theory	Total Time	AV OSPE					Time	AED Reflective Writing	OSVE				Total Practical Marks	
		C	HV	S	Total	Marks	C	Total	Marks	C	HV	S	Total	Marks	C	HV	S	Total				C	HV	S	Total	Marks			Viva	Copy				Total
First Module	Anatomy	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Physiology	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Biochemistry	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
Formative- Weekly LMS Based Assessment of 30 MCQs (10 MCQs per Subject)																																		
End of Module Assessment	Subject	Theory (Cognitive) Assessment																			Practical (Skill & Attitude) Assessment										Grand Total	Total Time of Module Assessment		
		MCQs					EMQs			SAQs					SEQs				Marks	Total Marks Theory	Total Time	AV OSPE					Time	AED Reflective Writing	OSVE				Total Practical Marks	
		C	HV	S	Total	Marks	C	Total	Marks	C	HV	S	Total	Marks	C	HV	S	Total				C	HV	S	Total	Marks			Viva	Copy				Total
Second Module	Anatomy	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Physiology	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Biochemistry	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
Formative- Weekly LMS Based Assessment tof 30 MCQs (10 MCQs per Subject)																																		

Block	Subjects	LMS Based Assessment					OSPE							Grand Total	Total Block Time		
		MCQs					LabOSPE		IOSPE		COSPE		Total			Marks	Time
		C	HV	S	Total	Time	C	HV	S								
BLOCK	Anatomy	21	6	3	30	30 min	14		4	2	20	60	6 HRS	90	10 HRS		
	Physiology	21	6	3	30	30 min	14		4	2	20	60	6 HRS	90	10 HRS		
	Biochemistry	21	6	3	30	30 min	14		4	2	20	60	6 HRS	90	10 HRS		

50% Questions/OSPE Stations/Viva Stations will be from Foundation Module and 50% Questions will be from MSK-1 Module

For Each assessment student will have to individually pass Theory and Practical components

Marks per
Item

MCQ=1	EMQ= 5	SAQ= 5	SEQ= 9	AVOSPE= 5	OSPE= 3
OSPE Time=1 Round of 40 Students =80 min					
3 Round of 40 Students =240 min					
OSVE=Time per student=5mins					

Weekly LMS Assessment			
Subjects	Anatomy	Physiology	Biochemist
No of MCQs*	30	30	30
Marks/MCQ	30	30	30
*MCQ=1 Mark each, 1 min each			

3.2.4 Continuous Internal Assessment (CIA)

Continuous Internal Assessment means the assessment based on tests and assignments given to the students during an academic period.

Break up of internal assessment is as follows:

Table 4: Block wise and subject wise distribution of CIA marks = 360Marks (40%)

Subjects	Block-I			Block-II			Block-III			Total CIA (40%)
	On campus assessments (30%)	Online LMS based Summative assessments (10%)	Total (40%)	On campus assessments (30%)	Online LMS based Summative assessments (10%)	Total (40%)	On campus assessments (30%)	Online LMS based Summative assessments (10%)	Total (40%)	
Anatomy	30	10	40	30	10	40	30	10	40	40+40+40=120
Physiology	30	10	40	30	10	40	30	10	40	40+40+40=120
Biochemistry	30	10	40	30	10	40	30	10	40	40+40+40=120
Total Marks of CIA	90	30	120	90	30	120	90	30	120	120+120+120= 360

Once internal assessment is compiled it CANNOT be altered under ANY circumstance unless a clerical/ human error is detected. He will repeat classes and skills There will be no change in calculated internal assessment scores for supplementary University examination.

No. of Assessments of Anatomy for First Year MBBS (Block- I):

Block	Sr. #	Module – 1 Foundation Module - I Components	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
Block – I	1	End Module Examinations (SEQs, SAQs, EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	30 Minutes	1 Formative	2 Summative	
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes					
	3	Weekly LMS based Assessment (MCQs based)	Summative	30 Minutes					
	Total				3 Hours & 05 Minutes			3 Assessments	
	Sr. #	Module – 2 MSK-I Module Components	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
	1	End Module Examinations (SEQs, SAQs, EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative	
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes					
	3	2 Weekly LMS based Assessment (MCQs based)	Summative	2 x 30 Minutes					
	Total				3 Hours & 35 Minutes			4 Assessments	
	Sr. #	Block – I Assessment	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
	1	Objectively Structured Practical Examination (OSPE)	Summative	5 Hours	5 Hours & 30 minutes			2 Summative	
	2	LMS Based Block Assessment (MCQs based)	Summative	30 Minutes					
			Total	5 Hours & 30 Minutes			2 Assessments		

No. of Assessments of Anatomy for First Year MBBS (Block- II):

Block	Sr. #	Module – 3 MSK-II Module Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
Block – II	1	End Module Examinations (SEQs, SAQs, EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	30 Minutes	1 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	3	Weekly LMS based Assessment (MCQs based)	Summative	30 Minutes				
	Total			3 Hours & 05 Minutes			3 Assessments	
	Sr. #	Module – 4 Hematology & Immunology Module-I Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	3	2 Weekly LMS based Assessment (MCQs based)	Summative	2 x 30 Minutes				
	Total			3 Hours & 35 Minutes			4 Assessments	
	Sr. #	Block – II Assessment	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
	1	Objectively Structured Practical Examination (OSPE)	Summative	5 Hours	5 Hours & 30 minutes			2 Summative
	2	LMS Based Block Assessment (MCQs based)	Summative	30 Minutes				
			Total	5 Hours & 30 Minutes			2 Assessments	

No. of Assessments of Anatomy for First Year MBBS (Block- III):

Block	Sr. #	Module – 5 CVS Module-I Components	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
Block – II	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	30 Minutes	1 Formative	2 Summative	
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes					
	3	Weekly LMS based Assessment (MCQs based)	Summative	30 Minutes					
	Total				3 Hours & 05 Minutes			3 Assessments	
	Sr. #	Module – 6 Respiration Module-I Components	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative	
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes					
	3	2 Weekly LMS based Assessment (MCQs based)	Summative	2 x 30 Minutes					
	Total				3 Hours & 35 Minutes			4 Assessments	
	Sr. #	Block – III Assessment	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
	1	Objectively Structured Practical Examination (OSPE)	Summative	5 Hours	5 Hours & 30 minutes			2 Summative	
	2	LMS Based Block Assessment (MCQs based)	Summative	30 Minutes					
		Total		5 Hours & 30 Minutes			2 Assessments		

Total Time of Anatomy Assessments for First Year MBBS:

Module	Summative Assessment Time	Formative Assessment Time	Total Assessments Time
Foundation Module - I	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
MSK-I Module	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -I	5 Hours & 30 Minutes		5 Hours & 30 Minutes
MSK-II Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Hematology & Immunology Module-I	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -II	5 Hours & 30 Minutes		5 Hours & 30 Minutes
CVS Module-I	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Respiration Module-I	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -III	5 Hours & 30 Minutes		5 Hours & 30 Minutes
Pre-Annual Examination		.....	7 Hours & 45 Minutes
First Professional		.....	3 Hours & 45 Minutes
Grand Total	31 Hours & 30 Minutes	4 hours and 30 minutes	48 Hours

Total Teaching Hours vs Total Assessment Hours

Ratio of Teaching Hours to Assessments Hours	Grand Total Teaching Hours 250 Hours:	Grand Total Assessment Hours 48 Hours
	5:1	

No. of Assessments of Physiology for First Year MBBS (Block- I):

Block	Sr. #	Module – 1 Foundation Module - I Components	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
Block – I	1	End Module Examinations (SEQs, SAQs, EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	30 Minutes	1 Formative	2 Summative	
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes					
	3	Weekly LMS based Assessment (MCQs based)	Summative	30 Minutes					
	Total				3 Hours & 05 Minutes			3 Assessments	
	Sr. #	Module – 2 MSK-I Module Components	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
	1	End Module Examinations (SEQs, SAQs, EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative	
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes					
	3	2 Weekly LMS based Assessment (MCQs based)	Summative	2 x 30 Minutes					
	Total				3 Hours & 35 Minutes			4 Assessments	
	Sr. #	Block – I Assessment	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
	1	Objectively Structured Practical Examination (OSPE)	Summative	5 Hours	5 Hours & 30 minutes			2 Summative	
	2	LMS Based Block Assessment (MCQs based)	Summative	30 Minutes					
			Total	5 Hours & 30 Minutes			2 Assessments		

No. of Assessments of Physiology for First Year MBBS (Block- II)

Block	Sr. #	Module – 3 MSK-II Module Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
Block – II	1	End Module Examinations (SEQs, SAQs, EMQs, MCQs Av OSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	30 Minutes	1 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	3	Weekly LMS based Assessment (MCQs based)	Summative	30 Minutes				
	Total			3 Hours & 05 Minutes			3 Assessments	
	Sr. #	Module – 4 Hematology & Immunology Module-I Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
	1	End Module Examinations (SEQs, SAQs, EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	3	2 Weekly LMS based Assessment (MCQs based)	Summative	2 x 30 Minutes				
	Total			3 Hours & 35 Minutes			4 Assessments	
	Sr. #	Block – II Assessment	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
	1	Objectively Structured Practical Examination (OSPE)	Summative	5 Hours	5 Hours & 30 minutes			2 Summative
	2	LMS Based Block Assessment (MCQs based)	Summative	30 Minutes				
	Total			5 Hours & 30 Minutes			2 Assessments	

No. of Assessments of Physiology for First Year MBBS (Block- III):

Block	Sr. #	Module – 5 CVS Module-I Components	Type of Assessment s	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
Block – II	1	End Module Examinations (SEQs, SAQs, EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	30 Minutes	1 Formative	2 Summative	
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes					
	3	Weekly LMS based Assessment (MCQs based)	Summative	30 Minutes					
	Total				3 Hours & 05 Minutes			3 Assessments	
	Sr. #	Module – 6 Respiration Module-I Components	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
	1	End Module Examinations (SEQs, SAQs, EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative	
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes					
	3	2 Weekly LMS based Assessment (MCQs based)	Summative	2 x 30 Minutes					
	Total				3 Hours & 35 Minutes			4 Assessments	
	Sr. #	Block – III Assessment	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
	1	Objectively Structured Practical Examination (OSPE)	Summative	5 Hours	5 Hours & 30 minutes			2 Summative	
	2	LMS Based Block Assessment (MCQs based)	Summative	30 Minutes					
			Total	5 Hours & 30 Minutes			2 Assessments		

Total Time of Physiology Assessments for First Year MBBS:

Module	Summative Assessment Time	Formative Assessment Time	Total Assessments Time
Foundation Module - I	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
MSK-I Module	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -I	5 Hours & 30 Minutes		5 Hours & 30 Minutes
MSK-II Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Hematology & Immunology Module-I	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -II	5 Hours & 30 Minutes		5 Hours & 30 Minutes
CVS Module-I	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Respiration Module-I	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -III	5 Hours & 30 Minutes		5 Hours & 30 Minutes
Pre-Annual Examination		.....	7 Hours & 45 Minutes
First Professional		.....	3 Hours & 45 Minutes
Grand Total	31 Hours & 30 Minutes	4 hours and 30 minutes	48 Hours

Total Teaching Hours vs Total Assessment Hours

Ratio of Teaching Hours to Assessments Hours	Grand Total Teaching Hours 225 hours:	Grand Total Assessment Hours 48 Hours
	9:2	

No. of Assessments of Biochemistry for First Year MBBS (Block- I):

Block	Sr. #	Module – 1 Foundation Module - I Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
Block – I	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	30 Minutes	1 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	3	Weekly LMS based Assessment (MCQs based)	Summative	30 Minutes				
	Total			3 Hours & 05 Minutes			3 Assessments	
	Sr. #	Module – 2 MSK-I Module Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	3	2 Weekly LMS based Assessment (MCQs based)	Summative	2 x 30 Minutes				
	Total			3 Hours & 35 Minutes			4 Assessments	
	Sr. #	Block – I Assessment	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
	1	Objectively Structured Practical Examination (OSPE)	Summative	5 Hours	5 Hours & 30 minutes			2 Summative
	2	LMS Based Block Assessment (MCQs based)	Summative	30 Minutes				
			Total	5 Hours & 30 Minutes			2 Assessments	

No. of Assessments of Biochemistry for First Year MBBS (Block- II):

Block	Sr. #	Module – 3 MSK-II Module Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
Block – II	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	30 Minutes	1 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	3	Weekly LMS based Assessment (MCQs based)	Summative	30 Minutes				
	Total			3 Hours & 05 Minutes			3 Assessments	
	Sr. #	Module – 4 Hematology & Immunology Module-I Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	3	2 Weekly LMS based Assessment (MCQs based)	Summative	2 x 30 Minutes				
	Total			3 Hours & 35 Minutes			4 Assessments	
	Sr. #	Block – II Assessment	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
	1	Objectively Structured Practical Examination (OSPE)	Summative	5 Hours	5 Hours & 30 minutes			2 Summative
	2	LMS Based Block Assessment (MCQs based)	Summative	30 Minutes				
			Total	5 Hours & 30 Minutes			2 Assessments	

No. of Assessments of Biochemistry for First Year MBBS (Block- III):

Block	Sr. #	Module – 5 CVS Module-I Components	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
Block – II	1	End Module Examinations (SEQs, SAQs, EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	30 Minutes	1 Formative	2 Summative	
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes					
	3	Weekly LMS based Assessment (MCQs based)	Summative	30 Minutes					
	Total				3 Hours & 05 Minutes			3 Assessments	
	Sr. #	Module – 6 Respiration Module-I Components	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative	
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes					
	3	2 Weekly LMS based Assessment (MCQs based)	Summative	2 x 30 Minutes					
	Total				3 Hours & 35 Minutes			4 Assessments	
	Sr. #	Block – III Assessment	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
	1	Objectively Structured Practical Examination (OSPE)	Summative	5 Hours	5 Hours & 30 minutes			2 Summative	
	2	LMS Based Block Assessment (MCQs based)	Summative	30 Minutes					
			Total	5 Hours & 30 Minutes			2 Assessments		

Total Time of Biochemistry Assessments for First Year MBBS:

Module	Summative Assessment Time	Formative Assessment Time	Total Assessments Time
Foundation Module - I	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
MSK-I Module	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -I	5 Hours & 30 Minutes		5 Hours & 30 Minutes
MSK-II Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Hematology & Immunology Module-I	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -II	5 Hours & 30 Minutes		5 Hours & 30 Minutes
CVS Module-I	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Respiration Module-I	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -III	5 Hours & 30 Minutes		5 Hours & 30 Minutes
Pre-Annual Examination		.....	7 Hours & 45 Minutes
First Professional		.....	3 Hours & 45 Minutes
Grand Total	31 Hours & 30 Minutes	4 hours and 30 minutes	48 Hours

Total Teaching Hours vs Total Assessment Hours

Ratio of Teaching Hours to Assessments Hours	Grand Total Teaching Hours 125 Hours:	Grand Total Assessment Hours 48 Hours
	5:2	

No. of Assessments of Clinical Component (Vertical and Horizontal Integration) for First Year MBBS (Block- I):

Block	Sr. #	Module – 1 Foundation Module - I Components	Type of Assessments	Total Assessments Time		No. of Assessments
				Assessment Time	Formative Assessment Time	
Block – I	1	Mid Module Examination (MCQs Based)	Formative	15 Minutes	45 Minutes	2 Formative
	2	End Module Examination (MCQs Based)	Formative	30 Minutes		
	Total			45 Minutes		2 Assessments
	Sr. #	Module – 2 MSK-I Module Components	Type of Assessments	Total Assessments Time		No. of Assessments
				Assessment Time	Formative Assessment Time	
	1	Mid Module Examination (MCQs Based)	Formative	15 Minutes	45 Minutes	2 Formative
	2	End Module Examination (MCQs Based)	Formative	30 Minutes		
	Total			45 Minutes		2 Assessments

No. of Assessments of Clinical Component (Vertical and Horizontal Integration) for First Year MBBS (Block- II):

Block	Sr. #	Module – 3 MSK-II Module Components	Type of Assessments	Total Assessments Time		No. of Assessments
				Assessment Time	Formative Assessment Time	
Block – II	1	Mid Module Examination (MCQs Based)	Formative	15 Minutes	45 Minutes	2 Formative
	2	End Module Examination (MCQs Based)	Formative	30 Minutes		
	Total			45 Minutes		2 Assessments
	Sr. #	Module – 4 Hematology & Immunology Module-I Components	Type of Assessments	Total Assessments Time		No. of Assessments
				Assessment Time	Formative Assessment Time	
	1	Mid Module Examination (MCQs Based)	Formative	15 Minutes	45 Minutes	2 Formative
	2	End Module Examination (MCQs Based)	Formative	30 Minutes		
	Total			45 Minutes		2 Assessments

No. of Assessments of Clinical Component (Vertical and Horizontal Integration) for First Year MBBS (Block- III):

Block	Sr. #	Module – 5 CVS Module-I Components	Type of Assessments	Total Assessments Time		No. of Assessments
				Assessment Time	Formative Assessment Time	
Block – III	1	Mid Module Examination (MCQs Based)	Formative	15 Minutes	45 Minutes	2 Formative
	2	End Module Examination (MCQs Based)	Formative	30 Minutes		
	Total			45 Minutes		2 Assessments
	Sr. #	Module – 6 Respiration Module-I Components	Type of Assessments	Total Assessments Time		No. of Assessments
				Assessment Time	Formative Assessment Time	
	1	Mid Module Examination (MCQs Based)	Formative	15 Minutes	45 Minutes	2 Formative
	2	End Module Examination (MCQs Based)	Formative	30 Minutes		
	Total			45 Minutes		2 Assessments

Total Time of Clinical Component (Vertical and Horizontal Integration) Assessments for First Year MBBS:

Module	Formative Assessment Time	Total Assessments Time
Foundation Module - I	45 Minutes	45 Minutes
MSK-I Module	45 Minutes	45 Minutes
Block -I		
MSK-II Module	45 Minutes	45 Minutes
Hematology & Immunology Module-I	45 Minutes	45 Minutes
Block -II		
CVS Module-I	45 Minutes	45 Minutes
Respiration Module-I	45 Minutes	45 Minutes
Block -III		
Pre-Annual Examination	.....	35 Minutes
First Professional	.....	60 Minutes
Grand Total	4 hours and 30 minutes	6 hours and 5 minutes

Total Teaching Hours vs Total Assessment Hours

Ratio of Teaching Hours to Assessments Hours	Grand Total Teaching Hours 97 Hours:	Grand Total Assessment Hours 6 Hours
	19:1	

3.2.4 Pre- Annual Assessment (PAA)

- It is mandatory to appear in all EBA to appear in PAA
- Transcript / good character certificate from head of departments will be needed to appear in pre-annual assessment.

Table of Specifications for Pre-Annual Examination

- Total Marks: 845

Total marks =800 Marks			
Subjects		% Weightage of subjects	Marks distribution as per weightage
	Anatomy	28%	240 Marks
	Physiology	28%	240 Marks
	Biochemistry	28%	240 Marks
	Integrated Subjects Community Medicine & Public Health/Research Behavioral Sciences Pathology Pharmacology Radiology Family Medicine Surgery Medicine Gynae & Obs Orthopedics Pediatrics Surgery Ophthalmology Otorhinolaryngology	14 %	115 Marks
	Early Clinical Exposure (ECE)	1%	5 Marks
	ALPHA(Artificial Intelligence, Leadership, Professionalism, Humanities & Arts) GEC (General Education Cluster)	1%	5 Marks
	Total Marks		845 Marks

Notes:

- The total marks for final Annual Assessment (Professional examination) are 900 as per UHS
- The total marks for Pre-Annual Assessment are 800 as OSVE is not being used as assessment tool.
- As per analysis of Module/Block results throughout the academic year, the passing percentage of students is generally higher in OSVE than in other assessment tools. For comprehensive assessment this tool will not be used in Pre- Annual Assessment.as per decision of assessment committee OSVE is not included.

A - Blockwise Distribution of Marks

Total Marks	BLOCK I Marks	BLOCK II Marks	BLOCK III Marks	Total Marks
845 Marks	285 Marks	285 Marks	275 Marks	845 Marks

B - Subject wise marks breakup in Blocks

Subjects	Block I	Block II	Block III	Total Marks
Anatomy	80 Marks	80 Marks	80 Marks	240 Marks (28%)
Physiology	80 Marks	80 Marks	80 Marks	240 Marks (28%)
Biochemistry	80 Marks	80 Marks	80 Marks	240 Marks (28%)
Integrated Subjects	45 Marks	45 Marks	35 Marks	125 Marks (16%)

C - Subject wise Break up of Marks for First year MBBS - Block -I

Block	Subjects	Theory (Knowledge)	Practical (Skill/attitude)	Total marks	Total marks (Core subjects + Integrated Subjects)		
Block I	Anatomy	50	30	80 marks	240+ 45 = 285 marks		
	Physiology	50	30	80 marks			
	Biochemistry	50	30	80 marks			
	Total			240 marks			
(Core subjects + Integrated Subjects)	Integrated Subjects			45 Marks			
	Community Medicine /Research	6 Marks					
	Behavioral Sciences	3 Marks					
	Pathology	2 Marks					
	Pharmacology	3 Marks					
	Radiology	2 Marks					
	Gynae & Obs	4 Marks					
	Medicine	2 Marks					
	Family Medicine	2 Marks					
	Pediatrics	4 Marks					
	Surgery	2 Marks					
	ECE		5 Marks				
	ALPHA and GEC		5 Marks				
	Total		240+ 45 = 285 marks				
	marks						

D - Subject wise Break up of Marks for First year MBBS - Block -II

Block	Subjects	Theory (Knowledge)	Practical (Skill/attitude)	Total marks	Total marks (Core subjects + Integrated Subjects)
Block II (Core subjects + Integrated Subjects) 285 Marks	Anatomy	50	30	80 marks	240+ 45 = 285 marks
	Physiology	50	30	80 marks	
	Biochemistry	50	30	80 marks	
	Total			240 marks	
	Integrated Subjects			45 Marks	
	Community Medicine /Research	4 Marks			
	Family Medicine	3 Marks			
	Orthopedics	3 Marks			
	Radiology	3 Marks			
	Medicine	3 Marks			
	Gynae & Obs	3 Marks			
	Behavioral Sciences	4 Marks			
	Pathology	2 Marks			
	ECE		5 Marks		
	ALPHA and GEC		5 Marks		
Total		240+ 45 = 285 marks			
marks					

E - Subject wise Break up of Marks for First year MBBS - Block -III

Block	Subjects	Theory (Knowledge)	Practical (Skill/attitude)	Total marks	Total marks (Core subjects + Integrated Subjects)		
Block III	Anatomy	50	30	80 marks	240+35 = 275 marks		
	Physiology	50	30	80 marks			
	Biochemistry	50	30	80 marks			
	Total			240 marks			
Total marks (Core subjects + Integrated Subjects)	Integrated Subjects			35 Marks			
	Community Medicine	2 Marks					
	Behavioral Sciences	2Marks					
	Medicine	3 Marks					
	Family medicine	3 Marks					
	Gynae & Obs	2 Marks					
	Radiology	2 Marks					
	Pediatrics	2 Marks					
	Otorhinolaryngology	3 Marks					
	Ophthalmology	2 Marks					
	Pathology	2Marks					
	Pharmacology	2 Marks					
	ECE		5 Marks				
	ALPHA and GEC		5 Marks				
	Total		240+35 = 275 marks				
	marks						
GRAND TOTAL MARKS		800					

F - Modular distribution of Marks for Module 1(Foundation Module - I) & Module 2(MSK-I Module) - Block -I

Block -I Theory Component (Knowledge)

Subjects	MCQs			EMQ			SAQ			SEQ			Total marks
	Module -1	Module- 2	Marks	Module -1	Module- 2	Marks	Module -1	Module- 2	Marks	Module -1	Module- 2	Marks	
Anatomy	13	12	25	-	01	5	01	01	10	0.5	0.5	10	50
Physiology	12	13	25		01	5	01	01	10		01	10	50
Biochemistry	15	10	25	-	01	5	01	01	10	01	-	10	50
Vertically & Spirally Integrated Subjects			35	-		-	-		-	-		-	35
Total	110		110	3		15	6		30	3		30	185

Block -I Practical Component (Skill & Attitude)

Subjects	Lab OSPE			Iospe			OSCE			Total stations	Total marks
	Number of Stations of Module -1	Number of Stations of Module -2	Marks	Number of Stations of Module -1	Number of Stations of Module -2	Marks	Number of Stations of Module -1	Number of Stations of Module -2	Marks		
Anatomy	01	02	15	01		5	01	01	10	6	30
Physiology	01	02	15		01	5	01	01	10	6	30
Biochemistry	01	02	15	-	01	5	01	01	10	6	30
ECE	-		-	-		-		01	5	1	5
ALPHA- Research	-		-	-		-		01	5	1	5
Total	9		45	3		15	8		40	20	100

G- Modular distribution of Marks for Module 3 (MSK-II Module) & Module 4(Haematology & Immunology Module-I) - Block -II

Block -II Theory Component (Knowledge)

Subjects	MCQs			EMQ			SAQ			SEQ			Total marks
	Module -1	Module-2	Marks	Module -1	Module-2	Marks	Module -1	Module-2	Marks	Module -1	Module-2	Marks	
Anatomy	12	13	25		01	5	01	01	10	0.5	0.5	10	50
Physiology	12	13	25		01	5	01	01	10		01	10	50
Biochemistry	10	15	25		01	5	01	01	10		01	10	50
Vertically & Spirally Integrated Subjects			35	-		-	-		-	-		-	35
Total	110		110	3		15	6		30	3		30	185

Block -II Practical Component (Skill & Attitude)

Subjects	Lab OSPE			I ospe			OSCE			Total stations	Total marks
	Number of Stations of Module -1	Number of Stations of Module -2	Marks	Number of Stations of Module -1	Number of Stations of Module -2	Marks	Number of Stations of Module -1	Number of Stations of Module -2	Marks		
Anatomy	02	01	15	-	01	5	01	01	10	6	30
Physiology	01	02	15		01	5	01	01	10	6	30
Biochemistry	01	02	15	01	-	5	01	01	10	6	30
ECE	-		-	-		-		01	5	1	5
ALPHA-Research	-		-	-		-		01	5	1	5
Total	9		45	3		15	8		40	20	100

H - Modular distribution of Marks for Module 5 (CVS Module-I) & Module 6 (Respiration Module-I) - Block -III

Block -III Theory Component (Knowledge)

Subjects	MCQs			EMQ			SAQ			SEQ			Total marks
	Module -1	Module-2	Marks	Module -1	Module-2	Marks	Module -1	Module-2	Marks	Module -1	Module-2	Marks	
Anatomy	13	12	25	01	-	5	01	01	10	0.5	0.5	10	50
Physiology	13	12	25	01		5	01	01	10	01		10	50
Biochemistry	13	12	25	01	-	5	01	01	10	01	-	10	50
Vertically & Spirally Integrated Subjects			25	-		-	-		-	-		-	25
Total	100		100	3		15	6		30	3		30	175

Block -III Practical Component (Skill & Attitude)

Subjects	Lab OSPE			I OSPE			OSCE			Total stations	Total marks
	Number of Stations of Module -1	Number of Stations of Module -2	Marks	Number of Stations of Module -1	Number of Stations of Module -2	Marks	Number of Stations of Module -1	Number of Stations of Module -2	Marks		
Anatomy	02	01	15	-	01	5	01	01	10	6	30
Physiology	02	01	15	01	-	5	01	01	10	6	30
Biochemistry	02	01	15	-	01	5	01	01	10	6	30
ECE	-		-	-		-		01	5	1	5
ALPHA-Research	-		-	-		-		01	5	1	5
Total	9		45	3		15	8		40	20	100

Calculation for Pre-Annual Assessment Implementation for First Year MBBS 2025

Block -I	Theory component (Knowledge)				Practical component (Skill & Attitude)			Total time required for Block – I pre annual assessment is 8 hrs and 25 minutes
	MCQs	SAQs	SEQs	EMQs	Lab OSPE	I OSPE	OSCE	
Total number of questions	110	6	3	3	9	3	8	
Time required for each component	110 x 1 min	6 x 10 min	3 x 10 min	3 x 5 min	9 x2.5 min	3 x 2.5 min	8 x 2.5 min	
	110 mins	60 mins	30 mins	25 mins	22.5 mins	7.5 mins	20 mins	
Total time	110+60+30+25 = 225 mins (4hrs and 25 mins)				22.5+7.5+20 = 50 mins/ round of 20 students			4 hrs
					If the OSPE is conducted simultaneously at 4 venues: In 50 minutes, 20 students can complete the OSPE at each venue, totaling 80 students across all venues. With 5 rounds at 4 venues, the entire class can complete the OSPE within 4 hours.			
Block -II	Theory component (Knowledge)				Practical component (Skill & Attitude)			Total time required for Block – II pre annual assessment is 8 hrs and 25 minutes
	MCQs	SAQs	SEQs	EMQs	Lab OSPE	I OSPE	OSCE	
Total number of questions	110	6	3	3	9	3	8	
Time required for each component	110 x 1 min	6 x 10 min	3 x 10 min	3 x 5 min	9 x2.5 min	3 x 2.5 min	8 x 2.5 min	
	110 mins	60 mins	30 mins	25 mins	22.5 mins	7.5 mins	20 mins	
Total time	110+60+30+25 = 225 mins (4hrs and 25 mins)				22.5+7.5+20 = 50 mins/ round of 20 students			4 hrs
					If the OSPE is conducted simultaneously at 4 venues: In 50 minutes, 20 students can complete the OSPE at each venue, totaling 80 students across all venues. With 5 rounds at 4 venues, the entire class can complete the OSPE within 4 hours.			
Block -III	Theory component (Knowledge)				Practical component (Skill & Attitude)			Total time required for Block – III pre annual assessment is 8 hrs and 15 minutes
	MCQs	SAQs	SEQs	EMQs	Lab OSPE	I OSPE	OSCE	
Total number of questions	100	6	3	3	9	3	8	
Time required for each component	100 x 1 min	6 x 10 min	3 x 10 min	3 x 5 min	9 x2.5 min	3 x 2.5 min	8 x 2.5 min	
	100 mins	60 mins	30 mins	25 mins	22.5 mins	7.5 mins	20 mins	
Total time	100+60+30+25 = 225 mins (4hrs and 15 mins)				22.5+7.5+20 = 50 mins/ round of 20 students			4 hrs
					If the OSPE is conducted simultaneously at 4 venues: In 50 minutes, 20 students can complete the OSPE at each venue, totaling 80 students across all venues. With 5 rounds at 4 venues, the entire class can complete the OSPE within 4 hours.			

Table of Specification: First and Second year Final Annual Assessment (Professional)

Statutes:

1. **Scheduling:** First Professional MBBS will be held at the end of First year whereas the Second Professional MBBS shall be held at the end of Second year.
2. **Subjects:** Every candidate is required to appear in the following subjects in Each Block
 - a. **Core subjects**
Integrated Anatomy, Integrated Physiology and Integrated Biochemistry
 - b. **Vertically integrated Subjects**
Community Medicine & Public Health, Behavioural Sciences, Pathology, Pharmacology and associated Clinical Subjects
 - c. **Spirally Integrated subjects**
General Education Cluster (GEC), ALPHA (Artificial Intelligence, Leadership, Professionalism, Humanities and Arts), Early Clinical Exposure (ECE) and Research.
3. **Assessments:** There will be three papers in First Annual Professional Examination and four papers in the Second Annual professional Examination.

Table: 1 Number of Papers/Blocks in First & Second Annual professional Examination

Paper	First year MBBS	Second year MBBS
Paper-1	Block -I	Block -I
Paper-2	Block- II	Block- II
Paper-3	Block-III	Block-III
Paper-4	Nil	GEC (Islamic Studies & Pakistan Studies)

- a. **First Professional Examination Total Marks = 900***
 - i. Block I Assessment Total Marks = 300
 - ii. Block II Assessment Total Marks = 300
 - iii. Block III Assessment Total Marks = 300
- b. **Second Professional Examination Total Marks = 1000 ***

- i. Block I Assessment Total Marks = 300
- ii. Block II Assessment Total Marks = 300
- iii. Block III Assessment Total Marks = 300
- iv. GEC Assessment (Islamic Studies & Pakistan Studies) Total Marks = 100

4. Continuous Internal Assessment (CIA):

Continuous Internal Assessment shall carry total marks = 360 (40% of the total allocated marks= 900) for first and second year MBBS .CIA will have two components for each block

A: On Campus assessments (30%) = 270 Marks

B: Online LMS Based Summative Assessments (10%) = 90 Marks

Total marks for each block per subject will be 120 marks.

5. Block Assessment Components: The components of Block Assessment shall be as follows:

A. One Theory Paper (Knowledge(K) having two sections

- i. **Section:1** will have Multiple choice questions (1 mark for each MCQ) and time allocated will be 1 minute for each MCQ. The integration ratio in MCQs will be 70% core content, 10% horizontal integration, and 20% vertical integration. There will be no negative marking
- ii. **Section:2** will have Structured Essay Questions of 5 marks each and time allocated for 1 SEQ will be 10 minutes.

Table: 2 Block wise Number of MCQs and SEQs in First & Second Annual professional Examination

First year MBBS	Number of MCQs	Number of SEQs
Block -I	60	6
Block -II	60	6
Block -III	60	6
Second Year MBBS	Number of MCQs	Number of SEQs
Block -I	60	6
Block -II	60	6
Block -III	60	6

B. Skill Assessment Component (Practical(P) and Attitude(A)):

The assessment will include an Objective Structured Practical Examination (OSPE) with a total of 18 stations, time allocated for each station will be 3 minutes.

i. Laboratory OSPE (Lab OSPE):

This section will consist of stations focused on practical (hands on performance) components from core subject areas, each station carries 5 marks.

ii. Integrated OSPE (I OSPE):

This section will include stations, from each core subject, emphasizing horizontal and vertical integration, each station carries 5 marks.

iii. Objective Structured Clinical Examinations (OSCE):

This section comprises of stations, dedicated to Early Clinical Exposure (ECE), Simulated Patients (SP), models, ALPHA and clinical component of core subjects, each station carries 5 marks.

iv. Objective Structured Viva Examinations (OSVE):

This section will consist of table viva for each core subject. Students will be evaluated by internal and external examiner using a structured marking rubric, with total marks 10.

Table: 3 Block wise Number of OSPE and OSVE Stations in First & Second Annual professional Examination

First year MBBS	Number of LabOSPE Stations	Number of iOSPE Stations	Number of OSCE Stations	Number of table VIVA /OSPE Station
Block -I	5	3	4	6
Block -II	5	3	4	6
Block -III	4	3	5	6
Second Year MBBS	Number of LabOSPE Stations	Number of iOSPE Stations	Number of OSCE Stations	Number of table VIVA /OSPE Station
Block -I	4	3	5	6
Block -II	5	3	4	6
Block -III	5	3	4	6

Table: 4 Block wise Total Number of MCQs, SEQs OSPE and OSVE Stations in First & Second Annual Professional Examination

First year MBBS	Number of MCQs	Number of SEQs	Number of OSPE Stations + OSVE
Block -I	60	6	18
Block -II	60	6	18
Block -III	60	6	18
Total	180 MCQs	18 SEQs	54 OSPE Stations
Second Year MBBS	Number of MCQs	Number of SEQs	Number of OSPE Stations + OSVE
Block -I	60	6	18
Block -II	60	6	18
Block -III	60	6	18
Total	180 MCQs	18 SEQs	54 OSPE Stations

- 5 **Annual Examination Eligibility Criteria:** Eligibility to appear in Annual Professional will be as per RMU Assessment Policy approved by the Academic Council and Syndicate.
- 6 **Passing Criteria:** The students of First & Second year MBBS must secure at least 50% marks separately in theory and practical exams of all core subjects (Anatomy, Physiology & Biochemistry), with an overall aggregate of 50% to pass in a Block Assessment. *
- 7 **Supplementary Examination Criteria:** If a student fails in any component (subject) within a Block, they shall appear in relevant block **only in that failed subject (s)** during the Supplementary Examination.

Table: 5 Table of Abbreviation

CIA	Continuous Internal Assessment
I-OSPE	Integrated OSPE
Lab OSPE	Laboratory Objective Structured Practical Examination
OSCE	Objective Structured Clinical Examinations
OSVE	Objective Structured Viva Examinations
ECE	Early Clinical Exposure
ALPHA	(Artificial Intelligence, Leadership, Professionalism, Humanities & Arts
GEC	General Education Cluster

K	Knowledge
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*Reference: University of Health Sciences Lahore (87th meeting of syndicate) Annexure 1

**Previous Model with 30% CIA
Annual Assessment Plan of First Year**

- Total First Professional Marks: 900
- Annual Marks: (70%) =630 Marks
- Continuous Internal Assessment (30%)

**A: Original Distribution of CIA
Marks (270 Marks)**

**B: Extrapolated marks to be calculated
throughout the Academic Year 2024**

Blocks	Subjects	Total marks	Module 1	Module 2	Total marks
Block 1 (90 Marks)	Anatomy	30	15 marks	15 marks	90
	Physiology	30	15 marks	15 marks	
	Biochemistry	30	15 marks	15 marks	
Block 2 (90 Marks)	Anatomy	30	15 marks	15 marks	90
	Physiology	30	15 marks	15 marks	
	Biochemistry	30	15 marks	15 marks	
Block 3 (90 Marks)	Anatomy	30	15 marks	15 marks	90
	Physiology	30	15 marks	15 marks	
	Biochemistry	30	15 marks	15 marks	
Total marks					270 Marks

MBBS 2024 (Batch 51)

=270 Marks
(Continuous Internal Assessment)

from Summative assessments

Blocks	Modules	Anatomy	Physiology	Biochemistry	Total
Block 1 1470 Marks	Module 1	200	200	200	600
	Module 2	200	200	200	600
	Block Exam	90	90	90	270
	Total	490	490	490	1470
Block 2 1470 Marks	Module 1	200	200	200	600
	Module 2	200	200	200	600
	Block Exam	90	90	90	270
	Total	490	490	490	1470
Block 3 1470 Marks	Module 1	200	200	200	600
	Module 2	200	200	200	600
	Block Exam	90	90	90	270
	Total	490	490	490	1470
Total Marks		1470	1470	1470	4410

Note:

- Total Operational marks =4410 converted to 270 marks and per block 1470 marks will be converted to 90 marks for Annual Professional marks calculation .

Continuous Internal Assessment (CIA) Plan of First Year MBBS 2025
With CIA 40%

- Total First Professional Marks: 900
- Annual Marks: (60%) =540 Marks
- Continuous Internal Assessment (40%)

Components of CIA

- **A:** CIA calculated from on campus assessments including LMS (on campus) =30%=270 Marks
- **B:** CIA calculated from Online LMS Assessments =10%=90 Marks

Table1: CIA calculated from on campus assessments =30%= 270 Marks

Total Block Marks	Subjects	Block wise subject Marks	Module 1 Marks	Module 2 Marks	Block Marks	Total Block Marks
Block – I 90 Marks	Anatomy	30 (Theory-15 Practical-15)	10 marks (Theory-6 Practical-4)	10 marks (Theory-6 Practical-4)	10 Marks (Theory-3 Practical-7)	Block – I 90 Marks
	Physiology	30 (Theory-15 Practical-15)	10 marks (Theory-6 Practical-4)	10 marks (Theory-6 Practical-4)	10 Marks (Theory-3 Practical-7)	
	Biochemistry	30 (Theory-15 Practical-15)	10 marks (Theory-6 Practical-4)	10 marks (Theory-6 Practical-4)	10 Marks (Theory-3 Practical-7)	
Block – II 90 Marks	Anatomy	30 (Theory-15 Practical-15)	10 marks (Theory-6 Practical-4)	10 marks (Theory-6 Practical-4)	10 Marks (Theory-3 Practical-7)	Block – II 90 Marks
	Physiology	30 (Theory-15 Practical-15)	10 marks (Theory-6 Practical-4)	10 marks (Theory-6 Practical-4)	10 Marks (Theory-3 Practical-7)	
	Biochemistry	30 (Theory-15 Practical-15)	10 marks (Theory-6 Practical-4)	10 marks (Theory-6 Practical-4)	10 Marks (Theory-3 Practical-7)	
Block – III 90 Marks	Anatomy	30 (Theory-15 Practical-15)	10 marks (Theory-6 Practical-4)	10 marks (Theory-6 Practical-4)	10 Marks (Theory-3 Practical-7)	Block – III 90 Marks
	Physiology	30 (Theory-15 Practical-15)	10 marks (Theory-6 Practical-4)	10 marks (Theory-6 Practical-4)	10 Marks (Theory-3 Practical-7)	

	Biochemistry	30 (Theory-15 Practical-15)	10 marks (Theory-6 Practical-4)	10 marks (Theory-6 Practical-4)	10 Marks (Theory-3 Practical-7)	
Total Marks of CIA						270 Marks

Table 2 : CIA calculated from Online LMS Summative Assessments = 10% = 90 Marks

Total Block Marks	Subjects	Block wise subject Marks	Module 1 Marks	Module 2 Marks	Total Block Marks
Block – I 30 Marks	Anatomy	10 (Theory-5 Practical-5)	5 marks (Theory-2.5 Practical-2.5)	5 marks (Theory-2.5 Practical-2.5)	Block – I 30 Marks
	Physiology	10 (Theory-5 Practical-5)	5 marks (Theory-2.5 Practical-2.5)	5 marks (Theory-2.5 Practical-2.5)	
	Biochemistry	10 (Theory-5 Practical-5)	5 marks (Theory-2.5 Practical-2.5)	5 marks (Theory-2.5 Practical-2.5)	
Block – II 30 Marks	Anatomy	10 (Theory-5 Practical-5)	5 marks (Theory-2.5 Practical-2.5)	5 marks (Theory-2.5 Practical-2.5)	Block – II 30 Marks
	Physiology	10 (Theory-5 Practical-5)	5 marks (Theory-2.5 Practical-2.5)	5 marks (Theory-2.5 Practical-2.5)	
	Biochemistry	10 (Theory-5 Practical-5)	5 marks (Theory-2.5 Practical-2.5)	5 marks (Theory-2.5 Practical-2.5)	
Block – III 30 Marks	Anatomy	10 (Theory-5 Practical-5)	5 marks (Theory-2.5 Practical-2.5)	5 marks (Theory-2.5 Practical-2.5)	Block – III 30 Marks
	Physiology	10 (Theory-5 Practical-5)	5 marks (Theory-2.5 Practical-2.5)	5 marks (Theory-2.5 Practical-2.5)	
	Biochemistry	10 (Theory-5 Practical-5)	5 marks (Theory-2.5 Practical-2.5)	5 marks (Theory-2.5 Practical-2.5)	

Table 3 : Extrapolated marks to be calculated from on campus Summative assessments throughout the Academic Year 2025

Blocks	Modules	Anatomy	Physiology	Biochemistry	Total
Block 1 1470 Marks	Module 1	200	200	200	600
	Module 2	200	200	200	600
	Block Exam	90	90	90	270
	Total	490	490	490	1470
Block 2 1470 Marks	Module 1	200	200	200	600
	Module 2	200	200	200	600
	Block Exam	90	90	90	270
	Total	490	490	490	1470
Block 3 1470 Marks	Module 1	200	200	200	600
	Module 2	200	200	200	600
	Block Exam	90	90	90	270
	Total	490	490	490	1470
Total Marks		1470	1470	1470	4410

Note:

- Total Operational marks =4410 converted to 270 marks and per block 1470 marks will be converted to 90 marks for Annual Professional marks calculation.
- The CIA should be submitted to Examination cell in round off values.

Table 4: Block wise and subject wise distribution of CIA marks = 360Marks (40%)

Subjects	Block-I			Block-II			Block-III			Total CIA (40%)
	On campus assessments (30%)	Online LMS based Summative assessments (10%)	Total (40%)	On campus assessments (30%)	Online LMS based Summative assessments (10%)	Total (40%)	On campus assessments (30%)	Online LMS based Summative assessments (10%)	Total (40%)	
Anatomy	30	10	40	30	10	40	30	10	40	40+40+40=120
Physiology	30	10	40	30	10	40	30	10	40	40+40+40=120
Biochemistry	30	10	40	30	10	40	30	10	40	40+40+40=120
Total Marks of CIA	90	30	120	90	30	120	90	30	120	120+120+120= 360

Table: 5 Module wise No of MCQs per subject per LMS Based Summative Assessment (10% CIA)

	No of MCQs per subject per LMS Based Summative Assessment	Module :1 (Number of MCQs x Number of LMS)	Module :2 (Number of MCQs x Number of LMS)	Module :3 (Number of MCQs x Number of LMS)	Module :4 (Number of MCQs x Number of LMS)	Module :5 (Number of MCQs x Number of LMS)	Module :6 (Number of MCQs x Number of LMS)	TOTAL Number of MCQs
Anatomy	40 MCQs	40 x2= 80 MCQs	40 x2= 80 MCQs	40 x2= 80 MCQs	40 x2= 80 MCQs	40 x2= 80 MCQs	40 MCQs	440
Physiology	40 MCQs	40 x2= 80 MCQs	40 x2= 80 MCQs	40 x2= 80 MCQs	40 x2= 80 MCQs	40 x2= 80 MCQs	40 MCQs	440
Biochemistry	40 MCQs	40 x2= 80 MCQs	40 x2= 80 MCQs	40 x2= 80 MCQs	40 x2= 80 MCQs	40 x2= 80 MCQs	40 MCQs	440
Total Number of MCQs		240	240	240	240	240	120	1320

Table:6 Table of specification of Continuous Internal Assessment (CIA) for LMS Based Summative Assessment

Subjects	Total No of MCQs Per LMS	Knowledge (K) +Practical (SKL)								Total time per LMS Assessment
		LGIS ,SGDs& Skill lab (50%)					SDL (50%)			
		Number of MCQs	Cognitive Domain			SKL	Number of MCQs	Cognitive Domain		
			C1	C2	C3			C1	C2	C3
Anatomy	40	20	2	3	10	5	20	5	5	10
Physiology	40	20	2	3	10	5	20	5	5	10
Biochemistry	40	20	2	3	10	5	20	5	5	10

Note: An LMS-based assessment conducted during the block is regarded as part of the on-campus assessment, with the resulting CIA contributing to the 30% weightage.

The time allocated for LMS Based Summative assessment (off Campus) will be 30 minutes for 40 Mcqs (0.75 seconds for 1 MCQ)

Table: 7 Table of specification of Continuous Internal Assessment (CIA) for First and Second year MBBS (On Campus assessments (30%))

Domains: C-Core Subject (70%) Levels C1-C2, HV- Horizontal & Vertical Integration (20%) Levels C2-C3, S- Spiral Integration (10%) Levels C2-C3																																		
End of Module Assessment	Subject	Theory (Cognitive) Assessment																		Practical (Skill & Attitude) Assessment										Grand Total	Total Time of Module Assessment			
		MCQs					EMQs			SAQs					SEQs				Marks	Total Marks Theory	Total Time	AV OSPE					Time	AED Reflective Writing	OSVE			Total Practical Marks		
		C	HV	S	Total	Marks	C	Total	Marks	C	HV	S	Total	Marks	C	HV	S	Total				C	HV	S	Total	Marks			Viva				Copy	Total
First Module	Anatomy	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Physiology	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Biochemistry	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
Formative- Weekly LMS Based Assessment of 30 MCQs (10 MCQs per Subject)																																		
End of Module Assessment	Subject	Theory (Cognitive) Assessment																		Practical (Skill & Attitude) Assessment										Grand Total	Total Time of Module Assessment			
		MCQs					EMQs			SAQs					SEQs				Marks	Total Marks Theory	Total Time	AV OSPE					Time	AED Reflective Writing	OSVE			Total Practical Marks		
		C	HV	S	Total	Marks	C	Total	Marks	C	HV	S	Total	Marks	C	HV	S	Total				C	HV	S	Total	Marks			Viva				Copy	Total
Second Module	Anatomy	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Physiology	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Biochemistry	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
Formative- Weekly LMS Based Assessmen tof 30 MCQs (10 MCQs per Subject)																																		

Block	Subjects	LMS Based Assessment					OSPE							Grand Total	Total Block Time		
		MCQs					LabOSPE		IOSPE		COSPE		Total			Marks	Time
		C	HV	S	Total	Time	C	HV	S								
BLOCK	Anatomy	21	6	3	30	30 min	14		4		2	20	60	6 HRS	90	10 HRS	
	Physiology	21	6	3	30	30 min	14		4		2	20	60	6 HRS	90	10 HRS	
	Biochemistry	21	6	3	30	30 min	14		4		2	20	60	6 HRS	90	10 HRS	

50% Questions/OSPE Stations/Viva Stations will be from Foundation Module and 50% Questions will be from MSK-1 Module															
For Each assessment student will have to individually pass Theory and Practical components															

Marks per Item											
MCQ=1		EMQ= 5		SAQ= 5		SEQ= 9		AVOSPE= 5		OSPE= 3	
OSPE Time=1 Round of 40 Students =80 min											
3 Round of 40 Students =240 min											
OSVE=Time per student=5mins											

Weekly LMS Assessment			
Subjects	Anatomy	Physiology	Biochemistry
No of MCQs*	30	30	30
Marks/MCQ	30	30	30
*MCQ=1 Mark each, 1 min each			

Final Annual Assessment (First professional Examinations) 2025(Batch 52)

- Total First Professional Marks: 900
- Continuous Internal Assessment (40%) =360 Marks
- Annual Marks: (60%) =540 Marks

A: First Professional Examination (60%)

A: First Professional Examination (60%) Total marks = 540 Marks		
Subjects	% Weightage of subjects	Marks distribution as per weightage
Anatomy	35%	188 Marks
Physiology	31%	166 Marks
Biochemistry	21%	114 Marks
Integrated Subjects Community Medicine & Public Health/Research Behavioural Sciences Pathology Pharmacology Radiology Family Medicine Surgery Medicine Gynae & Obs Orthopedics Pediatrics Surgery Ophthalmology Otorhinolaryngology	7 %	42Marks
Early Clinical Exposure ALPHA and General Education Cluster (GEC)	6 %	30 Marks
Total Marks		540 Marks

B: Block wise Distribution of Marks

Total Annual Professional Marks (60%)	BLOCK 1 Marks	BLOCK 2 Marks	BLOCK 3 Marks	Total Marks
540Marks	180 Marks	180 Marks	180 Marks	540 Marks

C: Subject wise marks breakup in Blocks

Subjects	Block 1	Block 2	Block 3	Total Marks
Anatomy	72 Marks	68 Marks	48 Marks	188 Marks (35%)
Physiology	40 Marks	54 Marks	72 Marks	166 Marks (31%)
Biochemistry	42 Marks	34 Marks	38 Marks	114 Marks (21%)
Integrated Subjects	26 Marks	24 Marks	22 Marks	72 Marks (13%)

D: Subject wise distribution of Marks for First year MBBS (Batch 52)

Block	Subjects	Theory	Practical	Total marks	Total marks
Block 1 (Core subjects + Integrated Subjects)	Anatomy	37 marks	35 marks	72 marks	(Core subjects + Integrated Subjects)
	Physiology	20 marks	20 marks	40 marks	
	Biochemistry	17 marks	25 marks	42 marks	
	Total	74	80	154 marks	
	Integrated Subjects			26Marks	
	Community Medicine /Research	3Marks			

180 Marks	Behavioural Sciences	2 Marks			154+26 = 180 marks
	Pathology	2 Marks			
	Pharmacology	3 Marks			
	Radiology	1 Mark			
	Gynae & Obs	1 Mark			
	Medicine	1 Mark			
	Family Medicine	1 Mark			
	Paediatrics	1 Mark			
	Surgery	1 Mark			
	ECE		5 Marks		
	ALPHA and GEC		5 Marks		
Total marks		154+26 = 180 marks			
Block	Subjects	Theory	Practical	Total marks	Total marks
Block 2 (Core subjects + Integrated Subjects) 210 Marks	Anatomy	33 marks	35 marks	68 marks	(Core subjects + Integrated Subjects) 156 +24 = 180 marks
	Physiology	29 marks	25 marks	54 marks	
	Biochemistry	14 marks	20 marks	34 marks	
	Total	76	80	156 Marks	
	Integrated Subjects			24 Marks	
	Community Medicine /Research	2 Marks			
	Family Medicine	1 Mark			
	Orthopedics	2 Marks			
	Radiology	2 Marks			
	Medicine	2 Marks			
	Gynae & Obs	1 Mark			
	Behavioural Sciences	2 Marks			
	Pathology	2 Marks			
	ECE		5 Marks		
	ALPHA and GEC		5 Marks		
	Total marks		156+24 = 180 marks		
Block	Subjects	Theory	Practical	Total marks	Total marks
Block 3	Anatomy	23 marks	25 marks	48marks	(Core subjects + Integrated Subjects)
	Physiology	42 marks	30 marks	72 marks	
	Biochemistry	13 marks	25 marks	38 marks	
	Total	78	80	158 marks	

(Core subjects + Integrated Subjects)	Integrated Subjects			22 Marks	158+22 = 180 marks
	Community Medicine	1 Marks			
	Behavioural Sciences	1 Marks			
	Medicine	1 Marks			
	Family medicine	1 Mark			
	Gynae & Obs	1 Mark			
	Radiology	1 Mark			
	Pediatrics	1 Mark			
	Otorhinolaryngology	1 Mark			
	Ophthalmology	1 Mark			
	Pathology	1 Marks			
	Pharmacology	1 Marks			
	ECE		5 Marks		
	ALPHA and GEC		5 Marks		
Total marks		158+22 = 180 marks			
GRAND TOTAL MARKS		540 Marks			

E: Block wise distribution of Marks for First year MBBS (Batch 52)
(Annual Professional Marks + CIA)

Subject	Theory			Practical			Total Marks
	Component	No of Items	Marks	Component	No of Stations	Marks	
Block I Total Annual marks=180	Section I- MCQ	60x1	60	LabOSPE	5 X 5	25	180
	Section II- SEQ	6x5	30	iOSPE	3 X 5	15	
				OSCE	4 X 5	20	
				OSVE	6 x 5	30	
	Total		90	Total		90	
CIA = 120 Marks	Continuous Internal Assessment (40%)		60	Continuous Internal Assessment (40%)		60	120
Total Annual marks+ CIA =180+120= 300	Total Marks		150	Total Marks		150	300

Block II Total Annual marks=180	Section I-MCQ	60x1	60	LabOSPE	5 X 5	25	180
	Section II-SEQ Total	6x5	30	iOSPE	3 X 5	15	
			OSCE	4 X 5	20		
			OSVE	6 x 5	30		
			Total	90			
CIA = 120 Marks	Continuous Internal Assessment (40%)		60	Continuous Internal Assessment (40%)		60	120
Total Annual marks+ CIA =180+120= 300	Total Marks		150	Total Marks		150	300
Block III Total Annual marks=180	Section I-MCQ	60x1	60	LabOSPE	5 X 5	25	180
	Section II-SEQ Total	6x5	30	iOSPE	3 X 5	15	
			OSCE	4 X 5	20		
			OSVE	6 x 5	30		
			Total	90			
CIA = 120 Marks	Continuous Internal Assessment (40%)		60	Continuous Internal Assessment (40%)		60	120
Total Annual marks + CIA =180+120= 300	Total Marks		150	Total Marks		150	300
Grand Total Marks							900

F: 1st Professional Examination 2025(Batch 52)
Block 1 Assessment Breakup
(Foundation & MSK-1 Module)

Themes	Discipline	Theory			Practical (OSPE)			OSVE	Marks	Total Marks per subject	
		No of MCQs (1 mark each)	No of SEQs (5 mark each)	Marks	No of LabOSPE Stations (5 marks each)	No of iOSPE Stations (5 marks each)	No of OSCE Stations (5 marks each)	OSVE (5 Marks each) (1Internal+1External)		Marks	%
Core & Horizontally Integrated Subjects	Anatomy & Applied /Clinical	22	3	37	3	1	1	2	35	72	40
	Physiology & Applied/Clinical	10	2	20	1	1	-	2	20	40	22
	Biochemistry & Applied/clinical	11	1	16	1	1	1	2	25	41	23
Vertically Integrated Subjects	Community Medicine & Public Health/Research	4	-	4	-	-	-	-	-	4	15
	Behavioural Sciences	2	-	2	-	-	-	-	-	2	
	Pathology	2	-	2	-	-	-	-	-	2	
	Radiology	1		1						1	
	Gynae & Obs	1		1						1	
	Medicine	1		1						1	
	Family Medicine	1		1						1	
	Paediatrics	1		1						1	
	Surgery	1		1						1	
	Pharmacology	3	-	3	-	-		-	-	3	
Spirally Integrated Subjects	ECE	-	-	-	-	-	1	-	5	5	5
	ALPHA and GEC	-	-	-	-	-	1	-	5	5	
Total		75	6x5=30	90	5x5=25	3x5=15	4x5=20	6 x5=30	90	180	100
Total		90			90				90+90=180		

G: 1st Professional Examination 2025 (Batch 52)

Block 2 Assessment

(MSK-2 & Blood/Immunity Module)

Theme	Subject	Theory			Practical			OSVE		Total Marks per subject	
		No of MCQs (1 mark each)	No of SEQs (5 mark each)	Marks	No of LabOSPE Stations (5 marks each)	No of iOSPE Stations (5 marks each)	No of OSCE Stations (5 marks each)	OSVE (5 Marks each)	Marks	Total Marks	%
Core & Horizontally Integrated Subjects	Anatomy & Applied /Clinical	18	3	33	3	1	1	2	35	68	37
	Physiology & Applied/Clinical	19	2	29	1	1	1	2	25	54	30
	Biochemistry & Applied/clinical	9	1	14	1	1	-	2	20	34	18
Vertically Integrated Subjects	Community Medicine & Public Health	2	-	2	-	-	-	-	-	2	13
	Behavioural Sciences	2	-	2	-	-	-	-	-	2	
	Pathology	2	-	2	-	-	-	-	-	2	
	Family Medicine	1		1						1	
	Orthopedics	2		2						2	
	Radiology	2		2						2	
	Medicine	2		2						2	
	Gynae & Obs	1		1						1	
Spirally Integrated Subjects	ECE	-	-	-	-	-	1	-	5	5	
	ALPHA and GEC	-	-	-	-	-	1	-	5	5	
Total		60	6x5=30	90	5x5=25	3x5=15	4x5=20	6x5=30	90	180	100
Total		90			90				90+90=180		

H: 1st Professional Examination 2025 (Batch 52)
Block 3 Assessment
(CVS & Respiratory Module)

Themes	Discipline	Theory			Practical			OSVE	Marks	Total Marks per subject	
		No of MCQs (1 mark each)	No of SEQs (5 mark each)	Marks	No of LabOSPE Stations (5 marks each)	No of iOSPE Stations (5 marks each)	No of OSCE Stations (5 marks each)	OSVE (5 Marks each)		Marks	%
Core & Horizontally Integrated Subjects	Anatomy & Applied /Clinical	13	2	23	1	1	1	2	25	48	27
	Physiology & Applied/Clinical	27	3	42	2	1	1	2	30	72	40
	Biochemistry & Applied/clinical	8	1	13	1	1	1	2	25	38	21
Vertically Integrated Subjects	Community Medicine & Public Health	1	-	1	-	-	-	-	-	1	12
	Behavioural Sciences	1	-	1	-	-	-	-	-	1	
	Pathology	1	-	1	-	-	-	-	-	1	
	Medicine	1		1						1	
	Family medicine	1		1						1	
	Gynae & Obs	1		1						1	
	Radiology	1		1						1	
	Pediatrics	1		1						1	
	Otorhinolaryngology	1		1						1	
	Ophthalmology	1		1						1	
	Pathology	1		1						1	
	Pharmacology	1	-	1	-	-	-	-		1	
Spirally Integrated Subjects	ECE	-	-	-	-	-	1	-	5	5	
	ALPHA and GEC	-	-	-	-	-	1	-	5	5	
Total		60	6x5=30	105	4x5=20	3x5=15	5x5=25	3x5=30	90	180	100
Total		90			90			90+90=180			

SECTION – VI

Time Table

RMU – 12 Integrated Modular MBBS Curriculum 2026

Isolation to *Beyond Boundaries*

CVS Module-I Time Table

First Year MBBS

Session 2025 – 2026

Batch – 53

CVS Module Team

Module Name	:	CVS Module
Duration of module	:	05 Weeks
Coordinator	:	Dr. Aneela Yasmeen
Co-Coordinator	:	Dr. Sheena Tariq
Reviewed by	:	Module Committee

Module Committee			Module Task Force Team		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Khurram	1.	Coordinator	Dr. Aneela Yasmeen (Senior Demonstrator of Physiology)
2.	Director DME & Dean Basic Sciences	Prof. Dr. Ifra Saeed	2.	DME Focal Person	Dr. Farzana Fatima
3.	Additional Director (Assessment) DME	Dr. Arsalan Manzoor Mughal	3.	Co-coordinator	Dr. Kashiif Ashraf (Senior Demonstrator of Anatomy)
4.	Chairperson Physiology	Prof. Dr. Samia Sarwar	4.	Co-Coordinator	Dr. Sheena Tariq (Senior Demonstrator of Physiology)
5.	Chairperson Anatomy	Prof. Dr. Ayesha Yousaf	5.	Co-coordinator	Dr. Rahat (Senior Demonstrator of Biochemistry)
6.	Chairperson Biochemistry	Dr. Aneela Jamil			
7.	Focal Person Anatomy 1 st Year MBBS	Ass. Prof. Dr. Tayyaba Qureshi			
8.	Focal Person Physiology	Dr. Sidra Hamid	DME Implementation Team		
9.	Focal Person Pharmacology	Dr. Zunera Hakim	1.	Director DME	Prof. Dr. Ifra Saeed
10.	Focal Person Pathology	Dr. Syeda Aisha	2.	Implementation Incharge 1st & 2 nd Year MBBS	Dr. Arsalan Manzoor Mughal
11.	Focal Person Behavioral Sciences	Dr. Zona Tahir			Dr. Farzana Fatima
12.	Focal Person Community Medicine	Dr. Afifa Kulsoom	3.	Assistant Director DME	Dr. Farzana Fatima
13.	Focal Person Quran Translation Lectures	Dr. Fahd Anwar	4.	Editor	Muhammad Arslan Aslam
14.	Focal Person Family Medicine	Dr. Sadia Khan			

Discipline Wise Details of Modular Content

Integration					
Themes					
Block	Department	General Anatomy	Embryology	Histology	Gross Anatomy
III	Anatomy	Heart & Vessels	Cardiovascular System	Heart & Vessels	Mediastinum, Heart, Great Vessels
	Biochemistry	Carbohydrate chemistry, Lipid chemistry			
	Physiology	- The Heart as a Pump and Function of the Heart Valves& regulation of heart pumping, cardiac cycle - Rhythmical Excitation of the Hear &Specialized excitatory&conductive system of the heart & its control (revisit) - Electrocardiogram, its interpretation & its abnormalities - Medical Physics of Pressure, Flow, and Resistance, Vascular Distensibility and Functions of the Arterial and Venous Systems - Microcirculation and the Lymphatic System, Local and Humoral Control of Blood Flow by the Tissues - Nervous Regulation of the Circulation, and Rapid & Long-Term Control of Arterial Pressure, hypertension - Cardiac Output, Venous Return, and Their Regulation - Muscle Blood Flow and Cardiac Output During Exercise; the Coronary & regional circulation - Cardiac Failure, Circulatory Shock - Heart Valves and Heart Sounds; Dynamics of Valvular and Congenital Heart Defects			
	Spiral Courses				
	Behavioural Sciences	- Sociology & Health - Anthropology & Health			
	Family Medicine	Approach to a patient with chest pain			
	Vertical Integration				
	Pathology	Edema			
	Pediatric	Congenital Heart Diseases			
	Eye	Retinal changes in hypertension			
	Pharmacology	- Clinical Pharmacology of Anti hypertensive drugs - Clinical pharmacology of antianginal - Clinical Pharmacology of Anti hypertensive drugs			
	Medicine	- Overview of acute coronary syndrome - Management of heart failure & shock - Hypertension - Dyspnea - Myocardial Infarction (MI)			
	Radiology	Chest radiograph with perspective of cardiovascular system			
	Gynae & Obs	- Cardiovascular changes in pregnancy, - Hypertensive disorders in pregnancy (gestational hypertension, pre-eclampsia)			

Categorization of Modular Contents Anatomy

Category A*	Category B**	Category C***			
		Demonstrations / SGD	CBL	SKL/Practical's	Self-Directed Learning (SDL)
Embryology	Histology	- Thoracic Wall / Thoracic Vertebra - Mediastinum - Pericardium - Heart (External Features) - Heart (Internal Features) - Heart (Clinical Correlations) - Vasculature of heart - Innervation of heart - Superior mediastinum - Posterior mediastinum (Contents) - Posterior mediastinum (Azygous system of veins) - Surface marking / Radiology	- Cardiac tamponade - Coarctation of aorta	- Elastic arteries - Medium and small sized arteries - Large veins - Medium and small sized veins	- Thoracic Wall / Thoracic Vertebra - Pericardium - Mediastinum - Vasculature of heart - Superior mediastinum - Azygous system of veins

Category A*: By Professor

Category B:** By Associate & Assistant Professors

Category C*:** By Senior Demonstrators & Demonstrators

Teaching Staff / Human Resources of Department of Anatomy

Sr. #	Designation of Teaching Staff / Human Resource	Total Number of Teaching Staff
1.	Professor of Anatomy department	01
2.	Associate Professor	01
3.	Demonstrators of Anatomy department	04

Contact Hours (Faculty)

Sr. #	Hours Calculation for Various Type of Teaching Strategies	Total Hours
1.	Large Group Interactive Session (LGIS)	$2 * 10 = 20$ hours
2.	Small Group Discussions (SGD)	$2*11+1 = 23$ hours
3.	Practical / Skill Lab	$1.5 * 20 = 30$ hours

Contact Hours (Students)

Sr. #	Hours Calculation for Various Type of Teaching Strategies	Total Hours
1.	Large Group Interactive Session (LGIS)	$1 * 10 = 10$ hours
2.	Small Group Discussions (SGD)	$2*11+1 = 23$ hours
3.	Practical / Skill Lab	$1.5 * 4 = 6$ hours
4.	Self-Directed Learning (SDL)	$1.5 * 8 = 12$ hours

Physiology

Category A*	Category B**	Category C***				
LGIS	LGIS	PBL	CBL	Practical's	SGD	SDL
- Short term regulation of blood pressure (Prof. Dr. Samia Sarwar/Dr Fahad) - Long term regulation of blood pressure (Prof. Dr. Samia Sarwar/Dr Fahad) - Circulatory Shock (Prof. Dr. Samia Sarwar/Dr Fareed) - Coronary circulation, Atherosclerosis & acute coronary occlusion Prof. Dr. Samia Sarwar/Dr Fahad	- Cardiac output & its control, measurement of cardiac output, pathologically high and low cardiac output (By Dr Sidra) - Cardiac cycle - I, Events of cardiac cycle and its graphical representation (By Dr Sidra) - Cardiac cycle – II, Functions of ventricles as pumps, aortic pressure curve, regulation of heart pumping (By Dr Sidra) - Cardiac cycle, Events of cardiac cycle and its graphical representation, Functions of ventricles as pumps, aortic pressure curve, regulation of heart pumping (SDL) By Dr Sidra - Introduction to CVS (By Dr Fahad) - Classification of blood vessels & Biophysical considerations (By Dr Aneela)		- Pitting edema - Palpitations/Tachycardia	- Examination of arterial pulse - Determination of Jugular Venous Pressure (JVP) - Clinical examination of chest for CVS - Determination of Blood Pressure (BP) - Effect of exercise & posture on arterial blood pressure - Recording of Electrocardiography (ECG) - Cardiopulmonary resuscitation (CPR) Demonstration of Triple Response	- Concept of vasomotion and starling forces - Regulation of blood pressure - Cardiac output and Venous return (second week) - ECG & its clinical importance (second week) - Arrhythmias (third week) - Short term regulation of blood pressure (fourth week) - Long term regulation of blood pressure (fourth week) - Coronary circulation, Atherosclerosis & acute coronary occlusion (fourth week) Cardiac cycle (fourth week)	SDL On Campus Heart Sounds - Capillary circulation, Concept of vasomotion and starling forces - Introduction to ECG & its clinical importance - Cardiac cycle - I, Events of cardiac cycle and its graphical representation - Arrhythmias - Congestive cardiac failure - Long term regulation of blood pressure - Skeletal muscle blood flow, Cardiovascular changes during exercise SDL Off Campus Introduction to CVS - Classification of blood vessels & Biophysical considerations - Regulation of blood flow

	• Heart Sounds (By Dr Uzma) • Regulation of blood flow (By Dr Aneela) • Capillary circulation, Concept of vasomotion and starling forces (By Dr Fahad) • Functions of veins, Venous return and factors affecting venous return (By Dr Kamil) • Introduction to ECG & its clinical importance (By Dr Fahad) • Vectorial analysis & arrhythmias I (By Dr Fahad) • Arrhythmias II (By Dr Fahad) • ECG changes in myocardial hypertrophies, ischemic heart disease (By Dr Fahad) • Congestive cardiac failure (By Dr Fareed) • Splanchnic circulation, cutaneous circulation (By Dr Fareed) • Skeletal muscle blood flow, Cardiovascular changes during exercise (By Dr Uzma)					4. Introduction to ECG & its clinical importance 5. Vectorial analysis & arrhythmias 6. Cardiac cycle 7. Splanchnic circulation, cutaneous circulation Regulation of blood pressure
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	- Fetal circulation & cardiac abnormalities in fetal circulation (By Dr Fahad)					
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- Category A*: By HOD and Associate Professor
- Category B**: By All (HOD, Associate, Assistant, Senior Demonstrators)
- Category C***: By Demonstrators and Residents

Teaching Staff / Human Resource of Department of Physiology

Sr. #	Designation Of Teaching Staff / HumanResource	Total number ofteaching staff
1.	Professor of physiology department	01
2.	Associate professor of physiology department	01
3.	Assistant professor of physiology department (AP)	01
4.	Demonstrators of physiology department	07
5.	Residents of physiology department (PGTs)	06

Contact Hours (Faculty) & Contact Hours (Students)

Sr. #	Hours Calculation for Various Type of Teaching Strategies	Total Hours
1.	Large Group Interactive Session (Lectures)	22X1 =22 Hours
2.	Small Group Discussions (SGD)/CBL	1.5X4 =6 Hours + 8 Hours (2nd,3rd ,4th week) = 14 Hours
3.	Problem Based Learning (PBL)	---
4.	Practical / Skill Lab	1.5X4 =6 Hours
5.	Self-Directed Learning (SDL)	8x1 = 8 Hours (On Campus) 8x1 = 8 Hours (Off Campus)

Biochemistry

Category A*	Category B**	Category C***			
LGIS	LGIS	PBL	CBL	Practical's	SGD
• Introduction and classification of carbohydrates & Isomerism • Monosaccharides & their chemical reaction • Simple lipids & Compound lipids • Disaccharides & homopolysaccharides • Derived lipids • Heteropolysaccharides • Prostaglandins	• Introduction and classification of lipids & Fatty acids •		• Atherosclerosis	• Lipid solubility & Acrolein Test & Emulsification • Benedict's test and Molisch's test • Barfoed's Test and Selivanoff's test • Iodine Test	• Classification of carbohydrates and lipids • Classification and properties of fatty acids • Heteropolysaccharides
Category A*: Associate Professor & Assistant Professor					
Category B**: Senior Demonstrators & APWMO					
Category C***: By All Demonstrators					

Teaching Staff / Human Resource of Department of Biochemistry

Sr. #	Designation of Teaching Staff / Human Resource	Total number of teaching staff
1	Associate professor of biochemistry department	01
2.	Assistant professor of biochemistry department (AP)	02
3.	Demonstrators of biochemistry department	07

Contact Hours (Faculty) & Contact Hours (Students)

Sr. #	Hours Calculation for Various Type of Teaching Strategies	Total Hours (Faculty)	Total Hours (student)
1.	Large Group Interactive Session (Lectures)	$2 * 8 = 16$ hours	08
2.	Small Group Discussions (SGD)	$1.5 * 5 = 22.5$ hours	4.5
3.	Problem Based Learning (PBL)	Zero	zero
4.	Practical / Skill Lab	$1.5 * 5 = 22.5$ hours	4.5
5.	Self-Directed Learning (SDL)	-----	08

First Year Timetable for CVS Module (First Week)
10-09-2026 to 16-09-2026

Date/Day	Theme	8:00am-9:20am		9:20am – 10:10am		10:10am – 10:30am	10:30am-11:20am		11:20am-12:10pm		12:10pm-12:30pm	12:30pm – 2:00pm	Home Assignments(2hrs)				
10-09-2026 Thursday	A Patient with Chest Pain & Palpitations	DISSECTION/SGD				Break	ANATOMY (LGIS)		PHYSIOLOGY (LGIS)		Break	Practical & SGD/CBL Topics & venue mentioned at the end	SDL Biochemistry Clinical Relevance of Carbohydrates				
		Thoracic Wall / Thoracic Vertebra					Embryology	General Anatomy	Introduction to CVS	Classification of Blood vessels & Biophysical considerations							
							Development of Venous System	(General Organization of CVS)									
							Prof. Dr. Ayesha / Assoc Prof. Dr. Arsalan (Even)	Assit. Prof. Dr. Sammiuya (Odd)	Dr Fahad (Even)	Dr. Aneela (Odd)							
Date/Day		8:00am– 09:00am		09:00am – 10:00am		10:00am – 11:00am		11:00am – 12:00pm		Home Assignments(2hrs)							
11-09-2026 Friday		BIOCHEMISTRY (LGIS)		MEDICINE		ANATOMY (LGIS)		PHYSIOLOGY (LGIS)		SDI Anatomy Thoracic Vertebrae							
		Introduction and classification of carbohydrates & Isomerism	Introduction and classification of lipids &Fatty acids	Overview of acute coronary syndrome		General Anatomy	Embryology	Classification of Blood vessels & Biophysical considerations	Introduction to CVS								
						(General Organization of CVS)	Development of Venous System										
		Dr. Kanwal (Even)	Dr. Aneela / Dr. Uzma Zafar (Odd)	Dr. Amina (Odd)	Dr. Mubashira (Even)	Assit. Dr. Sammiuya (Even)	Prof. Dr. Ayesha / Assoc Prof. Dr. Arsalan (Odd)	Dr. Aneela (Even)	Dr Fahad (Odd)								
12-09-2025 Saturday		FAMILY MEDICINE		BIOCHEMISTRY (LGIS)		Break	FAHME QURAN		PHYSIOLOGY (LGIS)		Break	Practical & SGD/CBL Topics & venue mentioned at the end	SDL Anatomy				
		Approach to a patient with chest pain		Introduction and classification of lipids &Fatty acids	Introduction and classification of carbohydrates & Isomerism		Adverb (حال)		Heart sounds	Regulation of blood flow							
		Dr Sidra Hamid (Odd)	Dr. Sadia Azam (Even)	Dr. Aneela / Dr. Uzma Zafar (Even)	Dr. Kanwal (Odd)		Qari Abdul Wahid		Dr. Mahnoor (Even)	Dr. Aneela (Odd)							
14-09-2025 Monday		DISSECTION/SGD		BEHAVIOURAL SCIENCES			Break	PBL 1 (SESSION I)		PHYSIOLOGY (LGIS)		Break	Practical & SGD/CBL Topics & venue mentioned at the end	SDL Physiology Classification of Blood vessels & Biophysical considerations			
		Mediastinum (General Features & Divisions)		Sociology & Health				PBL Team		Regulation of blood flow					Heart sounds		
				Dr. Faisal Aamir Malik (Even)	Dr. Mehboob Ali Shah (Odd)					Dr. Aneela (Even)					Dr. Mahnoor (Odd)		
15-09-2026 Tuesday		DISSECTION/SGD		PEDIATRIC				Break	ANATOMY (LGIS)				PHYSIOLOGY (LGIS)		Break	Practical & SGD/CBL Topics & venue mentioned at the end	SDL Physiology Introduction to CVS
		Dissection/Spotting		Congenital Heart Diseases					General Anatomy	Embryology			Capillary circulation, Concept of vasomotion and starling forces	Functions of veins, Venous return and factors affecting venous return			
				(Classification of vessels)	(Aortic Arches and derivatives)												
					Assit. Prof. Dr. Tayyaba (Even)	Prof. Dr. Ayesha / Assoc Prof. Dr. Arsalan (Odd)			Dr. Fahad (Even)	Dr. Sheena (Odd)							
16-09-2026 Wednesday	FAHME QURAN		ANATOMY (LGIS)		Break	CLINICO-CONCEPT CONNECT (C36) SESSION - I			PHYSIOLOGY (LGIS)		Break		Practical & SGD/CBL Topics & venue mentioned at the end	SDL Biochemistry Clinical Importance of Lipids			
	Masculine Plural بحرف المسبوق السالم المذكر جمع و السالم المذكر جمع الجر		(Aortic Arches and derivatives)			A Patient with Chest Pain & Palpitations			Functions of veins, Venous return and factors affecting venous return	Capillary circulation, Concept of vasomotion and starling forces							
						Anatomy										Dr. Sajjad	
						Physiology	Dr. Aneela										
						Biochemistry	Dr. Kanwal										
						Medicine											
						Pediatrics		Dr Sheena (Even)	Dr Fahad (Odd)								
						Behavioural Sciences											
	Community Medicine	Dr. Rizwana Shahid															
	Qari Abdul Wahid	Prof. Dr. Ayesha / Assoc Prof. Dr. Arsalan (Even)	Assit. Prof. Dr. Tayyaba (Odd)														

Table No. 1 (Time: 12:30pm – 02:00pm)															
Batch Distribution for Practical Skills (all subjects) CBL / Small Group Discussion (Biochemistry and Physiology)			Topics for Skill Lab with Venue		Schedule for Practical										
					Day	Histology Practical		Biochemistry Practical		Physiology Practical			Physiology SGD		Biochemistry SGD
Sr. No	Batch	Roll No.		Batch	Teacher Name	Batch	Teacher Name	Supervised by HOD	Batch	Teacher Name	Supervised by HOD		Batch	Teacher Name	Batch	Teacher Name
			Monday	C	Supervised by HOD	B	Dr. Rahat		E	Dr. Ali /Dr. Afsheen		A	Dr. Sheena	D	Dr. Uzma Zafar
1.	A	01-70	Tuesday	D		C	Dr. Almas		A	Dr. Sheena		B	Dr. Uzma	E	Dr. Romessa
2.	B	71-140	Wednesday	E		D	Dr. Uzma		B	Dr. Uzma		C	Dr. Farah	A	Dr. Sana Latif
3.	C	141-210	Thursday	B		A	Dr. Sana Latif		D	Dr. Nazia		E	Dr. Ali/Dr. Afsheen	C	Dr. Almas
4.	D	211-280	Saturday	A		E	Dr. Romessa		C	Dr. Farah		D	Dr. Nazia	B	Dr. Rahat
5.	E	281-onwards													
			• Elastic Arteries (Anatomy/ Histology-practical) venue Histology Laboratory (Dr. Kashif)												
			• Acrolein Test and lipid solubility and emulsification (Biochemistry practical) venue- Biochemistry Laboratory												
			• Examination of arterial pulse (Physiology –practical) Physiology Laboratory												
			• Determination of Jugular Venous Pressure (JVP) (Physiology – practical) Physiology Laboratory												

			Topics for SGDs / CBL with Venue											
			- Biochemistry tutorial – classification of carbohydrates and lipids - Concept of vasomotion and starling forces. (SGD) (Physiology Lecture Hall No.05) - Anatomy CBL: Cardiac Tamponade											

Table No. 2 Batch Distribution with Venues and Teachers Name for Problem Based Learning (PBL) Sessions									
Sr No.	Batches	Roll No	Venue	Teachers	Sr No.	Batches	Roll No	Venue	Teachers
1.	A1	(01-35)	Lecture Hall no.05 Physiology	Dr. Sana Latif (Senior Demonstrator Biochemistry)	6.	C2	(176-210)	New Lecture Hall Complex Lecture Theater # 03	Dr. Ayesha Arif (PGT Physiology)
2.	A2	(36-70)	Lecture Hall #.04 (1st Floor Anatomy)	Dr. Maaria (PGT Physiology)	7.	D1	(210-245)	New Lecture Hall Complex Lecture Theater # 02	Dr. Jawad (Demonstrator Physiology)
3.	B1	(71-105)	Anatomy Museum (First Floor Anatomy)	Dr. Nayab Ramzan (APWMO Biochemistry)	8.	D2	(246-280)	New Lecture Hall Complex Lecture Theater # 02	Dr. Kashif Ashraf (Demonstrator Anatomy)
4.	B2	(106-140)	Lecture Hall no.03 (First Floor)	Dr. Nida (Demonstrator of Anatomy)	9.	E1	(281-315)	Anatomy Museum (First Floor Anatomy)	Dr. Uzma Zafar (APWMO Biochemistry)
5.	C1	(141-175)	Anatomy Museum (First Floor Anatomy)	Dr. Farhat (PGT Physiology)	10	E2	(315 onwards)	Lecture Hall No.04	Dr. Najam (PGT Physiology)

Table No. 3 Venues for Large Group Interactive Session (LGIS)	
Odd Roll Numbers	New Lecture Hall Complex Lecture Theater # 03
Even Roll Number	New Lecture Hall Complex Lecture Theater # 02

Table No. 4 Batch Distribution and Venues for Anatomy Small Group Discussion SGDs / Dissections					Table No. 5 Batch Distribution and Venues for Physiology & Biochemistry Small Group Discussion SGDs						
Batches	Roll No	Subgroup	Anatomy Teacher	Venue	Batches	Roll No	Subgroup	Physiology Teacher	Physiology Venue	Biochemistry Teacher	Biochemistry Venue
A	01- 70	A1: Roll No (1 – 17) A2: Roll No (18 – 34) A3: Roll No (35 – 51) A4: Roll No (52 – 70)	Dr. Zenera (Demonstrator)	New Lecture Hall Complex 1	A	01-70	A1: Roll No (1 – 14) A2: Roll No (15 – 28) A3: Roll No (29 – 42) A4: Roll No (43 – 56) A5: Roll No (57 – 70)	Dr. Sheena Tariq (APWMO)	Physiology Lecture Hall 5	Dr. Uzma Zafar (APWMO)	Basement Lecture Hall No. 2
B	71-140	B1: Roll No (71 – 87) B2: Roll No (88 – 104) B3: Roll No (105 – 121) B4: Roll No (122 – 140)	Dr. Nida (Demonstrator)	New Lecture Hall Complex 03	B	71-140	B1: Roll No (71 – 84) B2: Roll No (85 – 98) B3: Roll No (99 – 112) B4: Roll No (113 – 126) B5: Roll No (127 – 140)	Dr. Uzma Kiyani (Senior Demonstrator)	Physiology Lecture Hall 5	Dr. Rahat (APWMO)	Basement Lecture Hall No. 2
C	141-210	C1: Roll No (141 – 157) C2: Roll No (158 – 174) C3: Roll No (175 – 191) C4: Roll No (192 – 210)	Dr. Tayyaba (Assistant Professor)	Anatomy Lecture Hall 04	C	141-210	C1: Roll No (141 – 154) C2: Roll No (155 – 168) C3: Roll No (169 – 182) C4: Roll No (183 – 196) C5: Roll No (197 – 210)	Dr. Farah Shah (Demonstrator)	Physiology Lecture Hall 5	Dr. Almas (APWMO)	Basement Lecture Hall No. 2
D	211- 280	D1: Roll No (211 – 227) D2: Roll No (228 - 244) D3: Roll No (245 – 261) D4: Roll No (262 – 280)	Dr. Nafeesa Kiran (Assistant Professor)	Anatomy Lecture Hall 03	D	211-280	D1: Roll No (211 – 224) D2: Roll No (225 – 238) D3: Roll No (239 – 252) D4: Roll No (253 – 266) D5: Roll No (267 – 280)	Dr. Nazia (Demonstrator)	Physiology Lecture Hall 5	Dr. Sana Latif (Senior Demonstrator)	Basement Lecture Hall No. 2
E	281- onwards	E1: Roll No (281 – 297) E2: Roll No (298 – 314) E3: Roll No (315 – 331) E4: Roll No (332 – onwards)	Dr. Sajjad Hussain (Senior. Demonstrator)	New Lecture Hall Complex 02	E	281- onwards	E1: Roll No (281 – 294) E2: Roll No (295 – 308) E3: Roll No (309 – 322) E4: Roll No (323 – 336) E5: Roll No (337 – onwards)	Dr. Ali Zain / Dr. Afsheen (P. G Trainee)	Physiology Lecture Hall 5	Dr. Romessa (Demonstrator)	Basement Lecture Hall No. 2
Supervised by Prof. Dr. Ayesha Yousaf					Supervised by Prof. Dr. Samia Sarwar					Supervised by. Dr. Aneela Jamil	

First Year Timetable for CVS Module (Second Week)

17-09-2026 to 23-09-2026

Date/Day	Theme	8:00am-9:20am		9:20am – 10:10am	10:10am – 10:30am	10:30am-11:20am		11:20am-12:10pm		12:10pm-12:30pm	12:30pm – 2:00pm	Home Assignments(2hrs)	
17-09-2026 Thursday	Raised Blood Pressure with Edema & Breathlessness	CBL/DISSECTION			Break	GYNAE & OBS (LGIS)		PHYSIOLOGY (LGIS)		Break	Practical & SGD/CBL Topics & venue mentioned at the end	SDL Biochemistry Fatty Acids Essential Molecules for Health & Disease	
		Pericardium / Cardiac tamponade				Hypertensive disorders in pregnancy (gestational hypertension, pre-eclampsia)		Short term regulation of blood pressure	ECG changes in myocardial hypertrophies, ischemic heart disease				
						Dr Shama Bashir (Even)	Dr. Zainab (Odd)						
						Prof. Dr. Samia / Dr. Aneela (Even)	Dr. Fahd (Odd)						
Date/Day		8:00am– 09:00am		09:00am – 10:00am		10:00am – 11:00am		11:00am – 12:00pm		SDL Anatomy Heart			
		MEDICINE (LGIS)	BIOCHEMISTRY (LGIS)		EYE LGIS		PHYSIOLOGY (LGIS)						
18-09-2026 Friday		Hypertension		Monosaccharides & their chemical reaction	Simple lipids & Compound lipids	Retinal changes in hypertension		ECG changes in myocardial hypertrophies, ischemic heart disease	Short term regulation of blood pressure				
		Dr. Amina (Odd)	Dr. Mubashira (Even)	Dr. kanwal (Even)	Dr. Tayyaba (Odd)	Dr. Saira (Even)		Dr. Salman (Odd)	Dr. Fahd (Odd)	Prof. Dr. Samia / Dr. Aneela (Even)			
Date/Day		8:00am-9:20am		9:20am – 10:10am		10:10am – 10:30am	10:30am-11:20am		11:20am-12:10pm		12:10pm-12:30pm	12:30pm – 2:00pm	Home Assignments(2hrs)
19-09-2026 Saturday		DISSECTION/SGD			Break	PHARMACOLOGY		PHYSIOLOGY (LGIS)		Break	Practical & SGD/CBL Topics & venue mentioned at the end	SDL Anatomy Vassculature of Heart	
	Heart (External Features)			Clinical Pharmacology Of Antihypertensive		Long term regulation of blood pressure	Congestive cardiac failure						
				Dr. Saba		Prof.Dr. Samia / Dr. Aneela (Even)	Dr. Fareed (Odd)						
	DISSECTION/SGD			PATHOLOGY (LGIS)		PHYSIOLOGY (LGIS)		Practical & SGD/CBL Topics & venue mentioned at the end	SDL Physiology Regulation of blood flow				
21-09-2026 Monday	Heart (Clinical Correlations of Heart)			Edema		Congestive cardiac failure	Long term regulation of blood pressure						
	Dr. Sara Rafi (Even)	Dr Rabia Khalid (Odd)	Dr. Fareed (Even)	Prof.Dr. Samia / Dr. Aneela ((Odd)									
	DISSECTION/SGD			PBL 1 (SESSION II)		PHYSIOLOGY (LGIS)		Practical & SGD/CBL Topics & venue mentioned at the end	SDL Physiology Introduction to ECG & its clinical importance				
22-09-2026 Tuesday	Heart (Internal Features)			PBL Team		Introduction to ECG & its clinical importance	Cardiac output & its control, measurement of cardiac output, pathologically high and low cardiac output-I						
						Dr. Fahd (Even)	Dr. Sidra (Odd)						
	Dissection		BIOCHEMISTRY (LGIS)			ANATOMY (LGIS)		CLINICO-CONCEPT CONNECT (C36) SESSION - II			Practical & SGD/CBL Topics & venue mentioned at the end	SDL Biochemistry Clinical Significance of Monoscrides Mid Clinico-Concept Connect (C ³ 6) Session Evaluation	
			Simple lipids & Compound lipids Monosaccharides & their chemical reaction		Histology		Embryology	Raised Blood Pressure with Edema & Breathlessness					
					(Arteries and Veins)		(Formation, Position and Partitioning of heart tube)		Anatomy	Dr. Zeneara			
									Physiology	Dr. Sheena			
									Biochemistry	Dr. Khalid			
					Assit. Prof. Dr. Summya Bashir (Even)		Prof. Dr. Ayesha / Assoc Prof. Dr. Arsalan (Odd)		Pathology				
									Medicine				
			Behavioural Sciences										
23-09-2026 Wednesday			Dr. Tayyaba (Even)	Dr. kanwal (Odd)					Community Medicine	Dr. Farah Pervaiz			

Table No. 1 (Time: 12:30pm – 02:00pm)																
Batch Distribution for Practical Skills (all subjects) CBL / Small Group Discussion (Biochemistry and Physiology)			Topics for Skill Lab with Venue	Schedule for Practical												
				Day	Histology Practical		Biochemistry Practical		Physiology Practical			Physiology SGD		Biochemistry SGD		
Batch	Teacher Name	Batch	Teacher Name		Batch	Teacher Name	Batch	Teacher Name	Batch	Teacher Name		Batch	Teacher Name			
Sr. No	Batch	Roll No.	- Medium & Small Sized Arteries (Anatomy/ Histology-practical) venue Histology Laboratory (Dr. Kashif) - Molisch’s test & Benedict’s Test (Biochemistry practical) venue- Biochemistry Laboratory - Clinical examination of chest for CVS (Physiology –practical) Physiology Laboratory - Determination of Blood Pressure (BP) (Physiology –practical) Physiology Laboratory	Monday	C	Supervised by HOD	B	Dr. Rahat	Supervised by HOD	E	Dr. Ali /Dr. Afsheen	Supervised by HOD	A	Dr. Sheena	D	Dr. Uzma Zafar
1.	A	01-70		Tuesday	D		C	Dr. Almas		A	Dr. Sheena		B	Dr. Uzma	E	Dr. Romessa
2.	B	71-140		Wednesday	E		D	Dr. Uzma		B	Dr. Uzma		C	Dr. Farah	A	Dr. Sana Latif
3.	C	141-210		Thursday	B		A	Dr. Sana Latif		D	Dr. Nazia		E	Dr. Ali/Dr. Afsheen	C	Dr. Almas
4.	D	211-280		Saturday	A		E	Dr. Romessa		C	Dr. Farah		D	Dr. Nazia	B	Dr. Rahat
5.	E	281-onwards														

		Topics for SGDs / CBL with Venue			
		- Biochemistry tutorial – Classification & Properties of Fatty Acids. (Biochemistry Basement demo room) - Physiology CBL- Pitting edema (Physiology Lecture Hall No.05)			

Table No. 2 Batch Distribution with Venues and Teachers Name for Problem Based Learning (PBL) Sessions									
Sr No.	Batches	Roll No	Venue	Teachers	Sr No.	Batches	Roll No	Venue	Teachers
1.	A1	(01-35)	Lecture Hall no.05 Physiology	Dr. Sana Latif (Senior Demonstrator Biochemistry)	6.	C2	(176-210)	New Lecture Hall Complex Lecture Theater # 03	Dr. Ayesha Arif (PGT Physiology)
2.	A2	(36-70)	Lecture Hall #.04 (1st Floor Anatomy)	Dr. Maaria (PGT Physiology)	7.	D1	(210-245)	New Lecture Hall Complex Lecture Theater # 02	Dr. Jawad (Demonstrator Physiology)
3.	B1	(71-105)	Anatomy Museum (First Floor Anatomy)	Dr. Nayab Ramzan (APWMO Biochemistry)	8.	D2	(246-280)	New Lecture Hall Complex Lecture Theater # 02	Dr. Kashif Ashraf (Demonstrator Anatomy)
4.	B2	(106-140)	Lecture Hall no.03 (First Floor)	Dr. Nida (Demonstrator of Anatomy)	9.	E1	(281-315)	Anatomy Museum (First Floor Anatomy)	Dr. Uzma Zafar (APWMO Biochemistry)
5.	C1	(141-175)	Anatomy Museum (First Floor Anatomy)	Dr. Farhat (PGT Physiology)	10	E2	(315 onwards)	Lecture Hall No.04	Dr. Najam (PGT Physiology)

Table No. 3 Venues for Large Group Interactive Session (LGIS)	
Odd Roll Numbers	New Lecture Hall Complex Lecture Theater # 03
Even Roll Number	New Lecture Hall Complex Lecture Theater # 02

Table No. 4 Batch Distribution and Venues for Anatomy Small Group Discussion SGDs / Dissections					Table No. 5 Batch Distribution and Venues for Physiology & Biochemistry Small Group Discussion SGDs						
Batches	Roll No	Subgroup	Anatomy Teacher	Venue	Batches	Roll No	Subgroup	Physiology Teacher	Physiology Venue	Biochemistry Teacher	Biochemistry Venue
A	01- 70	A1: Roll No (1 – 17) A2: Roll No (18 – 34) A3: Roll No (35 – 51) A4: Roll No (52 – 70)	Dr. Zenera (Demonstrator)	New Lecture Hall Complex 1	A	01-70	A1: Roll No (1 – 14) A2: Roll No (15 – 28) A3: Roll No (29 – 42) A4: Roll No (43 – 56) A5: Roll No (57 – 70)	Dr. Sheena Tariq (APWMO)	Physiology Lecture Hall 5	Dr. Uzma Zafar (APWMO)	Basement Lecture Hall No. 2
B	71-140	B1: Roll No (71 – 87) B2: Roll No (88 – 104) B3: Roll No (105 – 121) B4: Roll No (122 – 140)	Dr. Nida (Demonstrator)	New Lecture Hall Complex 03	B	71-140	B1: Roll No (71 – 84) B2: Roll No (85 – 98) B3: Roll No (99 – 112) B4: Roll No (113 – 126) B5: Roll No (127 – 140)	Dr. Uzma Kiyani (Senior Demonstrator)	Physiology Lecture Hall 5	Dr. Rahat (APWMO)	Basement Lecture Hall No. 2
C	141-210	C1: Roll No (141 – 157) C2: Roll No (158 – 174) C3: Roll No (175 – 191) C4: Roll No (192 – 210)	Dr. Tayyaba (Assistant Professor)	Anatomy Lecture Hall 04	C	141-210	C1: Roll No (141 – 154) C2: Roll No (155 – 168) C3: Roll No (169 – 182) C4: Roll No (183 – 196) C5: Roll No (197 – 210)	Dr. Farah Shah (Demonstrator)	Physiology Lecture Hall 5	Dr. Almas (APWMO)	Basement Lecture Hall No. 2
D	211- 280	D1: Roll No (211 – 227) D2: Roll No (228 - 244) D3: Roll No (245 – 261) D4: Roll No (262 – 280)	Dr. Nafeesa Kiran (Assistant Professor)	Anatomy Lecture Hall 03	D	211-280	D1: Roll No (211 – 224) D2: Roll No (225 – 238) D3: Roll No (239 – 252) D4: Roll No (253 – 266) D5: Roll No (267 – 280)	Dr. Nazia (Demonstrator)	Physiology Lecture Hall 5	Dr. Sana Latif (Senior Demonstrator)	Basement Lecture Hall No. 2
E	281- onwards	E1: Roll No (281 – 297) E2: Roll No (298 – 314) E3: Roll No (315 – 331) E4: Roll No (332 – onwards)	Dr. Sajjad Hussain (Senior. Demonstrator)	New Lecture Hall Complex 02	E	281- onwards	E1: Roll No (281 – 294) E2: Roll No (295 – 308) E3: Roll No (309 – 322) E4: Roll No (323 – 336) E5: Roll No (337 – onwards)	Dr. Ali Zain / Dr. Afsheen (P. G Trainee)	Physiology Lecture Hall 5	Dr. Romessa (Demonstrator)	Basement Lecture Hall No. 2
Supervised by Prof. Dr. Ayesha Yousaf					Supervised by Prof. Dr. Samia Sarwar					Supervised by. Dr. Aneela Jamil	

First Year Timetable for CVS Module (Third Week)

24-09-2026 to 30-09-2026

Date/Day	Theme	8:00am-9:20am	9:20am – 10:10am	10:10am – 10:30am	10:30am-11:15am	11:15am-12:00pm	12:00pm-01:00pm	01:00pm – 2:00pm	Home Assignments(2hrs)							
24-09-2026 Thursday	Exertional Dyspnea & Exercise Intolerance	DISSECTION/SGD			Break	ANATOMY (LGIS)		PHYSIOLOGY (LGIS)		Break	Practical & SGD/CBL Topics & venue mentioned at the end	SDL Biochemistry Compound lipids in health & Disease				
		Vassculature of Heart (Coarctation of Aorta)				Embryology		Histology								
						(Formation, Position and Partitioning of heart tube)		(Arteries and Veins)								
						Prof. Dr. Ayesha / Assoc Prof. Dr. Arsalan (Even)		Assit. Prof. Dr. Summya Bashir (Odd)								
					Dr. Fahd (Odd)		Dr. Sidra (Odd)									
25-09-2026 Friday		Early Clinical Exposure (ECE)														
Date/Day		8:00am-9:20am	9:20am – 10:10am	10:10am – 10:30am	10:30am-11:20am	11:20am-12:10pm	12:10pm-12:30pm	12:30pm – 2:00pm	Home Assignments(2hrs)							
26-09-2026 Saturday		DISSECTION/SGD			Break	GYNAE & OBS (LGIS)		PHYSIOLOGY (LGIS)		Break	Practical & SGD/CBL Topics & venue mentioned at the end	SDL Anatomy Innervation of Heart				
		Innervation of Heart				Cardiovascular changes in pregnancy, common cardiac diseases		Vectorial analysis & arrhythmias I					Cardiac cycle - I, Events of cardiac cycle and its graphical representation			
								Dr. Shehla (Even)					Dr Naila Nazeer (Odd)			
						Dr Fahd (Odd)		Dr Sidra (Even)								
28-09-2026 Monday		BIOCHEMISTRY (LGIS)		MEDICINE		ANATOMY (LGIS)		PHYSIOLOGY (LGIS)			Practical & SGD/CBL Topics & venue mentioned at the end	SDL Physiology Regulation of BP				
		Derived lipids	Disaccharides & homopolysaccharides	Dyspnea		Embryology		Histology								
		(Formation and partitioning of Ventricles)		(Capillaries)		Cardiac cycle - I, Events of cardiac cycle and its graphical representation		Vectorial analysis & arrhythmias I								
		Dr. Tayyaba (Even)	Dr. kanwal (Odd)	Dr. Waqar (Odd)		Dr. Aiman (Even)	Prof. Dr. Ayesha / Assoc Prof. Dr. Arsalan (Even)		Assit. Prof. Dr. Summya Bashir (Odd)							
						Dr Sidra (Odd)		Dr Fahd (Even)								
29-09-2026 Tuesday		DISSECTION/CBL				PHYSIOLOGY (LGIS)		PHYSIOLOGY (LGIS)			Practical & SGD/CBL Topics & venue mentioned at the end	SDL Physiology Regulation of BP				
		Superior Mediastinum (Trachea, Esophagus Ascending Aorta) (Coarctaion of Aorta)				Splanchnic circulation, cutaneous circulation		Arrhythmias II		Cardiac cycle – II, Functions of ventricles as pumps, aortic pressure curve, regulation of heart pumping						
						Dr. Fareed (Even)		Dr. Uzma/ Dr. Mahnoor (Odd)		Dr. Fahad (Even)			Dr Sidra (Odd)			
30-09-2026 Wednesday		PHARMACOLOGY		BIOCHEMISTRY (LGIS)		ANATOMY (LGIS)		CLINICO-CONCEPT CONNECT (C36) SESSION - III		Practical & SGD/CBL Topics & venue mentioned at the end	SDL Biochemistry Clinical Aspects of Disaccharides & Homopolysaccharide					
		Clinical pharmacology of antianginal		Disaccharides &homopolysaccharides		Histology		Embryology				Exertional Dyspnea & Exercise Intolerance				
						(Capillaries)		(Formation and partitioning of Ventricles)				Anatomy		Dr. Nida		
												Physiology		Dr. Aneela		
												Biochemistry		Dr. Nayab		
												Gynae & Obs				
						Pharmacology		Dr. Afira								
	Dr. Afira		Dr. kanwal (Even)		Dr. Tayyaba (Odd)		Assit. Prof. Dr. Summya Bashir (Even)		Prof. Dr. Ayesha / Assoc Prof. Dr. Arsalan (Odd)							
							Medicine		Dr. Rizwana Shahid							
							Community Medicine		Behavioural Sciences							

Table No. 1 (Time: 12:30pm – 02:00pm)																
Batch Distribution for Practical Skills (all subjects) CBL / Small Group Discussion (Biochemistry and Physiology)			Topics for Skill Lab with Venue	Schedule for Practical												
				Day	Histology Practical		Biochemistry Practical		Physiology Practical			Physiology SGD		Biochemistry SGD		
Batch	Teacher Name	Batch	Teacher Name		Supervised by HOD	Batch	Teacher Name	Supervised by HOD	Batch	Teacher Name		Batch	Teacher Name			
Sr. No	Batch	Roll No.	- Large Veins (Anatomy/ Histology-practical) venue Histology Laboratory (Dr. Kashif) - Selivanoff’s Test & Barfoed’s Test (Biochemistry practical) venue- Biochemistry Laboratory - Effect of exercise and posture on arterial blood pressure (Physiology – practical) Physiology Laboratory - Recording of Electrocardiography (ECG) (Physiology –practical). Physiology Laboratory	Monday		C	Supervised by HOD		B	Dr. Rahat	E	Dr. Ali /Dr. Afsheen	A	Dr. Sheena	D	Dr. Uzma Zafar
1.	A	01-70		Tuesday		D			C	Dr. Almas	A	Dr. Sheena	B	Dr. Uzma	E	Dr. Romessa
2.	B	71-140		Wednesday		E			D	Dr. Uzma	B	Dr. Uzma	C	Dr. Farah	A	Dr. Sana Latif
3.	C	141-210		Thursday		B			A	Dr. Sana Latif	D	Dr. Nazia	E	Dr. Ali/Dr. Afsheen	C	Dr. Almas
4.	D	211-280		Saturday		A			E	Dr. Romessa	C	Dr. Farah	D	Dr. Nazia	B	Dr. Rahat
5.	E	281-onwards														

	Topics for SGDs / CBL with Venue	
	• Biochemistry CBL- Atherosclerosis. • Physiology CBL Palpitations / Tachycardia (Physiology Lecture Hall No.05) • Anatomy CBL: Coarctation of Aorta	

Table No. 2 Batch Distribution with Venues and Teachers Name for Problem Based Learning (PBL) Sessions									
Sr No.	Batches	Roll No	Venue	Teachers	Sr No.	Batches	Roll No	Venue	Teachers
1.	A1	(01-35)	Lecture Hall no.05 Physiology	Dr. Sana Latif (Senior Demonstrator Biochemistry)	6.	C2	(176-210)	New Lecture Hall Complex Lecture Theater # 03	Dr. Ayesha Arif (PGT Physiology)
2.	A2	(36-70)	Lecture Hall #.04 (1st Floor Anatomy)	Dr. Maaria (PGT Physiology)	7.	D1	(210-245)	New Lecture Hall Complex Lecture Theater # 02	Dr. Jawad (Demonstrator Physiology)
3.	B1	(71-105)	Anatomy Museum (First Floor Anatomy)	Dr. Nayab Ramzan (APWMO Biochemistry)	8.	D2	(246-280)	New Lecture Hall Complex Lecture Theater # 02	Dr. Kashif Ashraf (Demonstrator Anatomy)
4.	B2	(106-140)	Lecture Hall no.03 (First Floor)	Dr. Nida (Demonstrator of Anatomy)	9.	E1	(281-315)	Anatomy Museum (First Floor Anatomy)	Dr. Uzma Zafar (APWMO Biochemistry)
5.	C1	(141-175)	Anatomy Museum (First FloorAnatomy)	Dr. Farhat (PGT Physiology)	10	E2	(315 onwards)	Lecture Hall No.04	Dr. Najam (PGT Physiology)

Table No. 3 Venues for Large Group Interactive Session (LGIS)	
Odd Roll Numbers	New Lecture Hall Complex Lecture Theater # 03
Even Roll Number	New Lecture Hall Complex Lecture Theater # 02

Table No. 4 Batch Distribution and Venues for Anatomy Small Group Discussion SGDs / Dissections					Table No. 5 Batch Distribution and Venues for Physiology & Biochemistry Small Group Discussion SGDs						
Batches	Roll No	Subgroup	Anatomy Teacher	Venue	Batches	Roll No	Subgroup	Physiology Teacher	Physiology Venue	Biochemistry Teacher	Biochemistry Venue
A	01- 70	A1: Roll No (1 – 17) A2: Roll No (18 – 34) A3: Roll No (35 – 51) A4: Roll No (52 – 70)	Dr. Zenera (Demonstrator)	New Lecture Hall Complex 1	A	01-70	A1: Roll No (1 – 14) A2: Roll No (15 – 28) A3: Roll No (29 – 42) A4: Roll No (43 – 56) A5: Roll No (57 – 70)	Dr. Sheena Tariq (APWMO)	Physiology Lecture Hall 5	Dr. Uzma Zafar (APWMO)	Basement Lecture Hall No. 2
B	71-140	B1: Roll No (71 – 87) B2: Roll No (88 – 104) B3: Roll No (105 – 121) B4: Roll No (122 – 140)	Dr. Nida (Demonstrator)	New Lecture Hall Complex 03	B	71-140	B1: Roll No (71 – 84) B2: Roll No (85 – 98) B3: Roll No (99 – 112) B4: Roll No (113 – 126) B5: Roll No (127 – 140)	Dr. Uzma Kiyani (Senior Demonstrator)	Physiology Lecture Hall 5	Dr. Rahat (APWMO)	Basement Lecture Hall No. 2
C	141-210	C1: Roll No (141 – 157) C2: Roll No (158 – 174) C3: Roll No (175 – 191) C4: Roll No (192 – 210)	Dr. Tayyaba (Assistant Professor)	Anatomy Lecture Hall 04	C	141-210	C1: Roll No (141 – 154) C2: Roll No (155 – 168) C3: Roll No (169 – 182) C4: Roll No (183 – 196) C5: Roll No (197 – 210)	Dr. Farah Shah (Demonstrator)	Physiology Lecture Hall 5	Dr. Almas (APWMO)	Basement Lecture Hall No. 2
D	211- 280	D1: Roll No (211 – 227) D2: Roll No (228 - 244) D3: Roll No (245 – 261) D4: Roll No (262 – 280)	Dr. Nafeesa Kiran (Assistant Professor)	Anatomy Lecture Hall 03	D	211-280	D1: Roll No (211 – 224) D2: Roll No (225 – 238) D3: Roll No (239 – 252) D4: Roll No (253 – 266) D5: Roll No (267 – 280)	Dr. Nazia (Demonstrator)	Physiology Lecture Hall 5	Dr. Sana Latif (Senior Demonstrator)	Basement Lecture Hall No. 2
E	281- onwards	E1: Roll No (281 – 297) E2: Roll No (298 – 314) E3: Roll No (315 – 331) E4: Roll No (332 – onwards)	Dr. Sajjad Hussain (Senior. Demonstrator)	New Lecture Hall Complex 02	E	281- onwards	E1: Roll No (281 – 294) E2: Roll No (295 – 308) E3: Roll No (309 – 322) E4: Roll No (323 – 336) E5: Roll No (337 – onwards)	Dr. Ali Zain / Dr. Afsheen (P. G Trainee)	Physiology Lecture Hall 5	Dr. Romessa (Demonstrator)	Basement Lecture Hall No. 2
Supervised by Prof. Dr. Ayesha Yousaf					Supervised by Prof. Dr. Samia Sarwar					Supervised by. Dr. Aneela Jamil	

First Year Timetable for CVS Module (Fourth Week)
01-10-2026 to 07-10-2026

Date/Day	Theme	8:00am-9:20am		9:20am – 10:10am		10:10am – 10:30am	10:30am-11:20am		11:20am-12:10pm		12:10pm-12:30pm	12:30pm – 2:00pm		Home Assignments(2hrs)					
01-10-2026 Thursday	Shock, Acute Chest Pain & Circulatory Collapse	DISSECTION/SGD				Break	PBL 2 (SESSION I)		PHYSIOLOGY (LGIS)		Break	Practical & SGD/CBL Topics & venue mentioned at the end	SDL Biochemistry Clinical Role of Prostaglandins						
		Posterior mediastinum (Contents)					PBL Team		Cardiac cycle – II, Functions of ventricles as pumps, aortic pressure curve, regulation of heart pumping					Arrhythmias II					
									Dr Sidra (Even)					Dr. Fahad (Odd)					
Date/Day		8:00am– 09:00am		09:00am – 10:00am		10:00am – 11:00am		11:00am – 12:00pm		SDL Anatomy Superior Mediastinum									
02-10-2026 Friday		BEHAVIOUR SCIENCES		PHYSIOLOGY (LGIS)		MEDICINE		PHYSIOLOGY (LGIS)											
		Anthropology & Health		Skeletal muscle blood flow, Cardiovascular changes during exercise		Splanchnic circulation, cutaneous circulation		Management of heart failure & shock							Fetal circulation & cardiac abnormalities in fetal circulation		Circulatory shock		
		Dr. Zona (Even)	Dr. Zarnain (Odd)	Dr. Uzma/ Dr. Mahnoor (Even)		Dr. Fareed (Odd)		Dr. Mubashira (Odd)		Dr. Amina (Even)		Dr. Fahad (Even)		Prof. Dr. Samia Sarwar / Dr.Aneela (Odd)					
Date/Day		8:00am-9:20am		9:20am – 10:10am		10:10am – 10:30am	10:30am-12:10pm					12:10pm-12:30pm	12:30pm – 2:00pm		Home Assignments(2hrs)				
03-10-2026 Saturday		PHARMACOLOGY		BIOCHEMISTRY(LGIS)		Break	MEDICINE		PHYSIOLOGY (LGIS)		Break	Practical & SGD/CBL Topics & venue mentioned at the end	SDL Anatomy Posterior Mediastinum						
		Clinical pharmacology of drugs used in cardiac failure		Heteropolysaccharides			Prostaglandins		Myocardial Infarction (MI)					Circulatory shock		Fetal circulation & cardiac abnormalities in fetal circulation			
		Dr. Zaheer (Even)	Dr. Ayesha (Odd)	Dr. Kanwal (Even)			Dr. Aneela (Odd)						Prof. Dr. Samia Sarwar / Dr. Aneela (Even)		Dr. Fahad (Odd)				
05-10-2026 Monday		RADIOLOGY (LGIS)		PBL 2 (SESSION II)			ANATOMY (LGIS)		PHYSIOLOGY (LGIS)				Practical & SGD/CBL Topics & venue mentioned at the end	SDL Physiology Vectorial analysis & arrhythmias					
		Chest radiograph with perspective of cardiovascular system		PBL Team			Embryology		Histology						Coronary circulation, Atherosclerosis & acute coronary occlusion		Short term regulation of blood pressure		
							(Fetal Circulation)		(Tunics of heart & Lymphatic System)										
		Dr Aniqua Saleem (Even)	Dr. Sadia (Odd)				Prof. Dr. Ayesha / Assoc Prof. Dr. Arsalan (Even)		Assit. Prof. Dr. Summya Bashir (Odd)						Prof.Dr. Samia/ Dr. Aneela (Even)		Dr. Afsheen SDL (Odd)		
06-10-2026 Tuesday	DISSECTION/SGD		Posterior Mediastinum (Azygous system of Veins)		ANATOMY (LGIS)		CLINICO-CONCEPT CONNECT (C36) SESSION - IV		Practical & SGD/CBL Topics & venue mentioned at the end	SDL Physiology Cardiac cycle									
					Histology		Embryology								Shock, Acute Chest Pain & Circulatory Collapse				
					(Tunics of heart & Lymphatic System)		(Fetal Circulation)								Anatomy		Dr. Nafeesa		
															Physiology		Dr. Sheena		
															Biochemistry		Dr. Almas		
															Pathology				
													Medicine						
													Pharmacology		Dr. Arsheen				
											Family Medicine								
											Community Medicine		Dr. Farah Pervaiz						
07-10-2026 Wednesday	DISSECTION/SGD		Cross Sectional Anatomy / Radiology		BIOCHEMISTRY(LGIS)		PHYSIOLOGY (LGIS)		Practical & SGD/CBL Topics & venue mentioned at the end	SDL Biochemistry End Clinico-Concept Connect (C³6) Session Evaluation									
					Prostaglandins		Heteropolysaccharides				Short term regulation of blood pressure		Coronary circulation, Atherosclerosis & acute coronary occlusion						
					Dr. Aneela (Even)		Dr. Kanwal (Odd)				Dr. Afsheen SDL (Even)		Prof. Dr. Samia/ Dr. Aneela (Odd)						

Table No. 1 (Time: 12:30pm – 02:00pm)																
Batch Distribution for Practical Skills (all subjects) CBL / Small Group Discussion (Biochemistry and Physiology)			Topics for Skill Lab with Venue	Schedule for Practical												
				Day	Histology Practical		Biochemistry Practical			Physiology Practical		Supervised by HOD	Physiology SGD		Biochemistry SGD	
Batch	Teacher Name	Batch	Teacher Name			Batch	Teacher Name	Batch	Teacher Name	Batch	Teacher Name		Batch	Teacher Name		
Sr. No	Batch	Roll No.	• Medium & Small Sized Veins (Anatomy/ Histology-practical) venue Histology Laboratory (Dr. Kashif) • Iodine Test (Biochemistry practical) venue- Biochemistry Laboratory • Cardiopulmonary resuscitation (CPR) (Physiology –practical) Physiology Laboratory • Demonstration of Triple Response (Physiology –practical) (Physiology Physiology Laboratory	Monday	C	Supervised by HOD	B	Dr. Rahat	Supervised by HOD	E	Dr. Ali /Dr. Afsheen	Supervised by HOD	A	Dr. Sheena	D	Dr. Uzma Zafar
1.	A	01-70		Tuesday	D		C	Dr. Almas		A	Dr. Sheena		B	Dr. Uzma	E	Dr. Romessa
2.	B	71-140		Wednesday	E		D	Dr. Uzma		B	Dr. Nazia		C	Dr. Farah	A	Dr. Sana Latif
3.	C	141-210		Thursday	B		A	Dr. Sana Latif		D	Dr. Nazia		E	Dr. Ali/Dr. Afsheen	C	Dr. Almas
4.	D	211-280		Saturday	A		E	Dr. Romessa		C	Dr. Farah		D	Dr. Nazia	B	Dr. Rahat
5.	E	281-onwards														

	Topics for SGDs / CBL with Venue	
	• Biochemistry Heteropolysaccharides SGD (Biochemistry Basement demo room) • Physiology tutorial- Regulation of blood pressure (Physiology Lecture Hall No.05)	

Table No. 4 Batch Distribution and Venues for Anatomy Small Group Discussion SGDs / Dissections					Table No. 5 Batch Distribution and Venues for Physiology & Biochemistry Small Group Discussion SGDs						
Batches	Roll No	Subgroup	Anatomy Teacher	Venue	Batches	Roll No	Subgroup	Physiology Teacher	Physiology Venue	Biochemistry Teacher	Biochemistry Venue
A	01- 70	A1: Roll No (1 – 17) A2: Roll No (18 – 34) A3: Roll No (35 – 51) A4: Roll No (52 – 70)	Dr. Zenera (Demonstrator)	New Lecture Hall Complex 1	A	01-70	A1: Roll No (1 – 14) A2: Roll No (15 – 28) A3: Roll No (29 – 42) A4: Roll No (43 – 56) A5: Roll No (57 – 70)	Dr. Sheena Tariq (APWMO)	Physiology Lecture Hall 5	Dr. Uzma Zafar (APWMO)	Basement Lecture Hall No. 2
B	71-140	B1: Roll No (71 – 87) B2: Roll No (88 – 104) B3: Roll No (105 – 121) B4: Roll No (122 – 140)	Dr. Nida (Demonstrator)	New Lecture Hall Complex 03	B	71-140	B1: Roll No (71 – 84) B2: Roll No (85 – 98) B3: Roll No (99 – 112) B4: Roll No (113 – 126) B5: Roll No (127 – 140)	Dr. Uzma Kiyani (Senior Demonstrator)	Physiology Lecture Hall 5	Dr. Rahat (APWMO)	Basement Lecture Hall No. 2
C	141-210	C1: Roll No (141 – 157) C2: Roll No (158 – 174) C3: Roll No (175 – 191) C4: Roll No (192 – 210)	Dr. Tayyaba (Assistant Professor)	Anatomy Lecture Hall 04	C	141-210	C1: Roll No (141 – 154) C2: Roll No (155 – 168) C3: Roll No (169 – 182) C4: Roll No (183 – 196) C5: Roll No (197 – 210)	Dr. Farah Shah (Demonstrator)	Physiology Lecture Hall 5	Dr. Almas (APWMO)	Basement Lecture Hall No. 2
D	211- 280	D1: Roll No (211 – 227) D2: Roll No (228 - 244) D3: Roll No (245 – 261) D4: Roll No (262 – 280)	Dr. Nafeesa Kiran (Assistant Professor)	Anatomy Lecture Hall 03	D	211-280	D1: Roll No (211 – 224) D2: Roll No (225 – 238) D3: Roll No (239 – 252) D4: Roll No (253 – 266) D5: Roll No (267 – 280)	Dr. Nazia (Demonstrator)	Physiology Lecture Hall 5	Dr. Sana Latif (Senior Demonstrator)	Basement Lecture Hall No. 2
E	281- onwards	E1: Roll No (281 – 297) E2: Roll No (298 – 314) E3: Roll No (315 – 331) E4: Roll No (332 – onwards)	Dr. Sajjad Hussain (Senior. Demonstrator)	New Lecture Hall Complex 02	E	281- onwards	E1: Roll No (281 – 294) E2: Roll No (295 – 308) E3: Roll No (309 – 322) E4: Roll No (323 – 336) E5: Roll No (337 – onwards)	Dr. Ali Zain / Dr. Afsheen (P. G Trainee)	Physiology Lecture Hall 5	Dr. Romessa (Demonstrator)	Basement Lecture Hall No. 2
Supervised by Prof. Dr. Ayesha Yousaf					Supervised by Prof. Dr. Samia Sarwar					Supervised by. Dr. Aneela Jamil	

Schedule for LMS Based Weekly Online Assessments for First Year MBBS (CVS Module)

The Online Assessment for CVS Module for First Year MBBS will be as per following schedule:

Class	Module	Day & Date	Time of Assessment	Focal person	Department Responsible
First Year MBBS	CVS Module	Monday 21-09-2026	7:00 pm-7:40pm	Prof. Dr Ayesha Yousaf	Anatomy
		Tuesday 22-09-2026	7:00 pm-7:40pm	Prof. Dr Samia Sarwar	Physiology
		Wednesday 23-09-2026	7:00 pm-7:40pm	Dr Aneela Jamil	Biochemistry
		Monday 28-09-2026	7:00 pm-7:40pm	Prof. Dr Ayesha Yousaf	Anatomy
		Tuesday 29-09-2026	7:00 pm-7:40pm	Prof. Dr Samia Sarwar	Physiology
		Wednesday 30-09-2026	7:00 pm-7:40pm	Dr Aneela Jamil	Biochemistry

First Year Timetable for CVS Module (Fifth Week)
08-10-2026 to 14-10-2026

Day/ Time	8:00AM– 02:00PM
08-10-2026 Thursday	Assessment Week
09-10-2026 Friday	
10-10-2026 Saturday	
12-10-2026 Monday	
13-10-2026 Tuesday	
14-10-2026 Wednesday	

Annexure I

Templates for Theory Paper

- **MCQ, SEQ Paper, & EMQ**

Templates for AV OSPE

Templates for Structured Viva

Note: These sample papers aim to facilitate comprehension. However, it's important to note that the content and format of actual assessment papers may differ.

RMU-12
Integrated Modular Curriculum 2026
Isolation to Beyond Boundaries

Approved Template of Module Assessment

Multiple choice questions (MCQs)		% Weightage	Number of MCQs	Level of Cognition
Section A	Complimentary Integration (Theme Based) of Anatomy / Physiology / Biochemistry	(70%)	18MCQs	C1-C4
Section B	Integrations	(30%)		
	• Multidisciplinary Integration	(10%)	2 MCQs	C4
	• Interdisciplinary Integration	(5%)	1 MCQs	C4, C5
	• Transdisciplinary Integration	(5%)	2 MCQs	C5, C6
	• C ³ 6 Sessions Transdisciplinary Integration	(10%)	2 MCQs	C6

Chairperson

Department of _____
Rawalpindi Medical University, Rawalpindi

Additional Director Assessment

Rawalpindi Medical University
Rawalpindi

Director DME

Rawalpindi Medical University
Rawalpindi

Prof. Dr. Muhammad Umar
Vice Chancellor
Rawalpindi Medical University
Rawalpindi

Rawalpindi Medical University Rawalpindi

Department of Anatomy, Physiology & Biochemistry
MCQs & EMQ Paper for _____ Module, First Year MBBS Batch 53
Date: 00-00-0000

Total Marks: 30 (MCQs: 25, EMQ: 5)

Total Time: 30 Minutes

Each MCQ carries 1 mark and EMQ carries 5 marks

Roll No. _____

Name. _____

Encircle the single best response

Q.#	RMU-12 Integrated Modular Curriculum 2026 Isolation to Beyond Boundaries Integrated Modular Assessment of the Subject Anatomy, Physiology & Biochemistry Section A: Complimentary Integration of Anatomy / Physiology / Biochemistry (70%)	Level of Cognition
1.	Question a. b. c. d. e. USMLE: Type Question Reference: Ganong 25 th Edition Page No. 101	C1
Section – B: Integrations (30%)		
Multidisciplinary Integration (5%)		
2.	Horizontal Integration with Anatomy (2.5%) Questions a. b. c. d. e. USMLE: Type Question Reference: Ganong 25 th Edition Page No. 101	C4
Interdisciplinary/Transdisciplinary Integration (15%)		

3.	Question a. b. c. d. e. USMLE: Type Question Reference: Ganong 25 th Edition Page No. 101	C5
C ³ 6 Sessions Integration (10%)		
4.	Question a. b. c. d. e. USMLE: Type Question Reference: Ganong 25 th Edition Page No. 101	C6
5.	Question a. b. c. d. e. USMLE: Type Question Reference: Ganong 25 th Edition Page No. 101	C6

RMU-12
Integrated Modular Curriculum 2026
Isolation to Beyond Boundaries
Approved Template of Module Assessment

Short Answer Questions (SAQs) Total Marks: 25 (Each SAQ carries 5 marks)	% Weightage	Number of SAQs	Level of Cognition
Complimentary Integration (Theme Based) of Anatomy / Physiology / Biochemistry	(60%)	3SAQ	C1-C4
Integrations	(40%)		
Multidisciplinary Integration	(20%)	1SAQ	C4
Interdisciplinary Integration / Transdisciplinary Integration / C ³ 6 Sessions Transdisciplinary Integration	(20%)	1SAQ	C4, C5

Short Essay Question (SEQs) Total Marks: 45 (Each SEQ carries 9 marks)	% Weightage	Number of SEQs	Level of Cognition
Complimentary Integration (Theme Based) of Anatomy / Physiology / Biochemistry	(60%)	3SEQ	C1-C4
Integrations	(40%)		
Multidisciplinary Integration	(20%)	1SEQ	C4
Interdisciplinary Integration / Transdisciplinary Integration / C ³ 6 Sessions Transdisciplinary Integration	(20%)	1SEQ	C4, C5

Chairperson
Department of _____
Rawalpindi Medical University, Rawalpindi

Additional Director Assessment
Rawalpindi Medical University
Rawalpindi

Director DME
Rawalpindi Medical University
Rawalpindi

Prof. Dr. Muhammad Umar
Vice Chancellor
Rawalpindi Medical University
Rawalpindi

Rawalpindi Medical University Rawalpindi
Department of Anatomy, Physiology & Biochemistry
SEQ & SAQ Paper for _____ Module, _____ Year MBBS Batch _____
Date: 00-00-0000

Total Marks: 70
Each SAQ carries 5 marks
Each SEQ carries 9 marks

Time allowed: 1 hour & 30 minutes
Each SAQ: 5 minutes, SEQ: 10 minutes
Attempt all Questions

RMU-12 Integrated Modular Curriculum 2026 Isolation to Beyond Boundaries Integrated Modular Assessment of the Subject Anatomy, Physiology & Biochemistry					
Integration		Percentage			
• Complimentary Integration (Theme Based) of Anatomy/Physiology Biochemistry (CI)		(70%)			
• Integration		(30%)			
○ Multidisciplinary Integration (MI)		(05%)			
○ Interdisciplinary (II)/Transdisciplinary Integration (TI)		(15%)			
○ C³6 Assessment		(10%)			
Q.#	Construct your Answers according to the given Scenarios and Questions	Domain	Marks	% Weightage	Level of Cognition
Short Answer Questions (SAQs) Total Marks: 25 (Each SAQ carries marks)					
SA Q 1	A 55 years Male, known case of Coronary Artery Disease, presented to.....	CI & TI	.....	.....	.....
	a.	CI	2	8%	C2
	b.	CI	2	12%	C2
					

	c.	CI	2	8%	C2
	d.	CI	2	12%	C2
	e. USMLE Question. References: Part a: Guyton & Hall 14 th Edition page # 114 Part b: Guyton & Hall 14 th Edition Page # 116	CI	1	8%	C2
Short Essay Question (SEQs) Total Marks: 45					
SEQ 1	A 55 years Male, known case of Coronary Artery Disease, presented to.....	CI & TI	.....	.....	..... ...
	a.	MI with Anatomy	2	6.66%	C4
	b.	CI	3	6.66%	C2
	c.	CI	2	6.66%	C2
	d.	CI	1	6.66%	C2
	e. USMLE Style Question. References: - Part a: Guyton & Hall 14th Edition page # 101 - Part b: Guyton & Hall 14th Edition Page # 103	CI	1	6.66%	C2

	Part c: Guyton & Hall 14th Edition Page # 103				
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Rawalpindi Medical University Rawalpindi
Department of Anatomy / Physiology / Biochemistry
Clinically Oriented Audio Visual Objective Structured Practical Examination (OSPE)
_____ Module 2026

_____ Year MBBS (Batch _____)

Day: _____

Date: _____

10 AV OSPE Slides

Time Allowed: 50 minutes

05 minutes for each slide

Chairperson

Department of _____
Rawalpindi Medical University, Rawalpindi

Additional Director Assessment

Rawalpindi Medical University
Rawalpindi

Director DME

Rawalpindi Medical University
Rawalpindi

Vice Chancellor

Rawalpindi Medical University
Rawalpindi

Slide 1

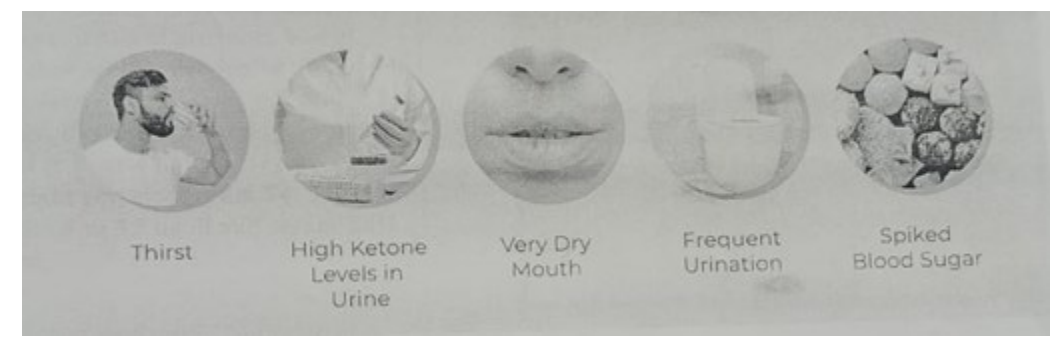
Core Knowledge with Horizontal / Vertical / Spiral Integration

Topic:

Teaching Strategy:

Requirements: Answer sheet, Pen

Objective: _____



- | | |
|---------|------|
| 1. | (01) |
| 2. | (01) |
| 3. | (01) |
| 4. | (01) |
| 5. | (01) |

Slide 1

Key for Examiner

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|---------|
| 1. |
| 2. |
| 3. |
| 4. |
| 5. |

CVS Module (Structured Viva)

Date: Time: 8:00-2:00pm

Roll no: 181 onwards

[illegible]

P: Punctuality, D: Dressing, C: Communication

Instructions:

All students should bring their gross sketch copy
University ID CARD is must during viva examination

Prof. Dr. Ayesha Yousaf
Head of Anatomy Department
Rawalpindi Medical University
Rawalpindi

Department of Physiology
CVS Module (Structured Viva)

MODULE: _____ DATE: _____ TEACHER NAME: _____ SIGNATURE _____

[illegible]

***Objective Structured Practical Examination (OSPE) will be held in end of block assessment.**

Department of Biochemistry
CVS Module (Structured Viva)

Date:

Time:

Teacher's Name _____

[illegible]

***Objective Structured Practical Examination (OSPE) will be held in end of block assessment.**

Rawalpindi Medical University
1st Year MBBS Model MCQS (USMLE Format)

1.	A 21-year-old boy had a motorcycle accident. On x-ray groove in the lower surface of the cuboid bone was destroyed. Which of the following muscle tendons is most likely damaged? A). Flexor hallucis longus B). Peroneus brevis C). Peroneus longus D). Tibialis anterior E). Tibialis posterior	Anatomy
2.	A 6-year-old boy is brought to the pediatric clinic for a routine follow-up. He has β -thalassemia major and receives regular blood transfusions. On examination, he appears pale with mild hepatosplenomegaly. His serum ferritin levels are significantly elevated. MRI shows iron deposition in the liver. A liver biopsy reveals golden-yellow granules that stain positively with Prussian blue. Which of the following is the most likely insoluble storage form of iron found in his tissues due to iron overload? A). Ferritin B). Apoferritin C). Hemopexin D). Hemosiderin E). Ferroheme	Physiology
3.	A 19-year-old medical student is reviewing the biochemical pathways involved in hormone synthesis. He learns that cholesterol serves as a precursor in the biosynthesis of certain hormones. He wants to understand which hormone types are synthesized from cholesterol. Which of the following types of hormones is synthesized from cholesterol? A) Peptide B) Amine derivative C) Protein D) Steroid E) Glycoprotein	Biochemistry

Rawalpindi Medical University
1st Year MBBS Model SEQs & SAQs (USMLE Format)

Q1. A 21-year-old medical student is studying the internal anatomy of the heart during a dissection session. While examining the right ventricle, he is asked to identify its internal characteristic features and explain their functions. He observes various muscular ridges and structures attached to valve leaflets and the ventricular wall. - Which of the following muscular ridges is characteristic of the rough inflow part of the right ventricle? - The papillary muscles in the right ventricle are connected to which structure to help prevent valve prolapse during systole? - Which muscular band extends from the interventricular septum to the anterior papillary muscle in the right ventricle and carries part of the right bundle branch? - What is the name of the smooth-walled, superior part of the right ventricle that leads into the pulmonary trunk? - Damage to the moderator band during cardiac surgery could interfere with which of the following cardiac functions?	Anatomy
Q2. A 20-year-old medical student is preparing for her physiology viva. Her professor asks her to explain the concept of cardiac output and how it is regulated in both resting and active states. She begins reviewing the basics of heart function, blood flow, and factors affecting cardiac performance. - Which of the following best defines cardiac output? - If a patient's stroke volume is 70 mL and heart rate is 75 beats/min, what is their cardiac output? - Which of the following factors will increase cardiac output? - A 65-year-old man with severe heart failure is found to have a low cardiac output. What symptom is most likely a direct consequence of this? - During exercise, cardiac output can increase up to 4–5 times the resting value. Which of the following contributes most significantly to this increase?	Physiology
Q3. A 19-year-old first-year MBBS student is studying for her biochemistry exam. While reviewing the structures of carbohydrates, she comes across the terms anomers and epimers, and wants to understand their definitions, differences, and clinical relevance, especially in glucose metabolism. - Which of the following best defines epimers? - What defines anomers among sugar molecules? - Which of the following pairs are epimers of each other? - Which of the following best describes the difference between α-D-glucose and β-D-glucose? - Which of the following best explains why understanding epimers and anomers is important in medicine?	Biochemistry

Sample Paper of EMQ

Topic: Tetralogy of Fallot

Theme: Congenital Heart Diseases – Tetralogy of Fallot

Instruction:

For each stem (A–E), choose the most appropriate option (1–10) from the list below. Each option may be used once, more than once, or not at all.

Options:

1. Right ventricular hypertrophy
2. Atrial septal defect
3. Ventricular septal defect
4. Pulmonary stenosis
5. Overriding aorta
6. Patent ductus arteriosus
7. Tricuspid atresia
8. Left ventricular hypertrophy
9. Transposition of the great vessels
10. Coarctation of the aorta

Stems:

- A. A structural defect that allows mixing of oxygenated and deoxygenated blood between the ventricles.
- B. A feature that causes reduced pulmonary blood flow and cyanosis in Tetralogy of Fallot.
- C. A compensatory muscular change in the heart due to increased pressure load on the right ventricle.
- D. A major vessel that receives blood from both ventricles due to misalignment of the septum.
- E. One of the four cardinal features not seen in Tetralogy of Fallot.

Answer Key:

- A. 3 – Ventricular septal defect
- B. 4 – Pulmonary stenosis
- C. 1 – Right ventricular hypertrophy
- D. 5 – Overriding aorta
- E. 2 – Atrial septal defect

Rawalpindi Medical University
1st Year MBBS Model AV OSPE

Slide 1 / Video

Core Knowledge with Horizontal / Vertical / Spiral Integration

Topic: Fallot's Tetrolgi

Teaching Strategy: Small Group Discussion

Requirements: Answer sheet, Pen

Objective: To Assess the Knowledge of Students Regarding Fallot's Tetrolgy



1. What are the four anatomical defects that make up Tetralogy of Fallot? (1)
2. Why do children with Tetralogy of Fallot often exhibit “cyanotic spells” or “tet spells”? (1)
3. What is the physiological consequence of the right-to-left shunt seen in Tetralogy of Fallot? (1)
4. Why do children with TOF often squat during a cyanotic episode? (1)
5. What is the definitive treatment for Tetralogy of Fallot? (1)

Annexure II

CVS Module-I Entrustable Professional Activities (EPAs)

THEME I: A Patient with Chest Pain & Palpitations

EPA-1: Obtain Relevant History in a Patient Presenting with Chest Pain and Palpitations

Level of Entrustment: Level 2

Activity: Obtain relevant history

1. Title of the EPA

Obtain relevant history from a patient presenting with chest pain and palpitations.

2. Specification and Limitations

This EPA focuses on the ability of the student to obtain a relevant, focused, and structured history from a 17-year-old male student presenting with sudden onset chest discomfort and palpitations.

The student is expected to establish rapport with the patient and his father, introduce himself or herself, ensure privacy, and take consent before starting the history. The student should explore the presenting complaints of chest discomfort and palpitations in detail, including onset, duration, site, character, severity, radiation, aggravating and relieving factors, and associated symptoms.

The student should specifically ask about shortness of breath, sweating, dizziness, syncope, anxiety, fever, cough, trauma to the chest, vomiting, drug intake, smoking, and previous similar episodes. The student should also explore exertional triggers, emotional stress, spontaneous termination of symptoms, and any family history of heart disease or sudden cardiac death at a young age.

This EPA is limited to **history taking only**. The student is not expected to independently diagnose, investigate, or manage the patient. Any red-flag symptom identified during history taking must be reported immediately to the supervising clinician.

3. Most Relevant Domains of Competence

The most relevant domains of competence for this EPA are:

Medical Expert / Clinical Reasoner
Communicator
Professional
Health Advocate
Collaborator

4. Required Knowledge, Skills, Attitude, and Behaviour

A. Knowledge

The student should be able to demonstrate knowledge of:

1. Basic anatomy of the thoracic wall, mediastinum, heart position, and great vessels in relation to localization of chest pain.
2. Physiological basis of pulse, blood pressure, heart sounds, sympathetic stimulation, tachycardia, exertional palpitations, and anxiety-related cardiovascular responses.
3. Common causes of chest pain and palpitations in adolescents, including musculoskeletal, respiratory, gastrointestinal, anxiety-related, and cardiac causes.
4. Important red flags such as exertional chest pain, syncope, persistent palpitations, family history of early cardiac disease or sudden cardiac death, abnormal ECG findings, severe breathlessness, and hemodynamic instability.
5. Relationship between exertion, sympathetic activation, increased cardiac workload, myocardial oxygen demand, and cardiac energy metabolism.
6. Importance of relevant negative history, including absence of fever, cough, chest trauma, vomiting, smoking, drug abuse, and loss of consciousness.

B. Skills

The student should be able to:

1. Introduce himself or herself, confirm patient identity, obtain consent, ensure privacy, and establish rapport with the patient and his father.
2. Begin the encounter with open-ended questions and then use focused questions to explore chest pain and palpitations in detail.
3. Take a structured chest pain history using SOCRATES or OPQRST, including site, onset, character, radiation, associated symptoms, timing, exacerbating factors, relieving factors, and severity.
4. Explore palpitations by asking about onset, duration, frequency, triggers, relation with exertion or emotional stress, rhythm regularity, mode of termination, and associated symptoms.
5. Ask about previous similar episodes, physical activity, emotional stress, hydration, caffeine intake, sleep pattern, psychosocial stressors, past illness, medication use, family history, smoking, and substance abuse.
6. Identify red-flag symptoms during history taking and report them promptly to the supervising clinician.
7. Summarize relevant positive and negative findings and present the history to the supervisor in an organized manner.

C. Attitude and Behaviour

The student should be able to demonstrate:

1. Empathy and attentive listening toward an anxious adolescent presenting with chest pain and palpitations.
2. Respectful response to the patient's concern: "Doctor, is something wrong with my heart? Can chest pain at my age be dangerous?"
3. Clear, understandable, and non-alarming communication with both the patient and his father.
4. Balanced reassurance without dismissing symptoms or giving false assurance.
5. Maintenance of patient privacy, dignity, and confidentiality throughout the encounter.
6. Professional behaviour in an emergency setting.
7. Recognition of personal limitations as a learner and willingness to seek help from the supervisor when red-flag symptoms or concerning history points are identified.

5. Assessment Information Sources

Progress and entrustment decision may be assessed through direct observation of history taking in a simulated or real clinical encounter.

The student may be assessed through Mini-CEX, OSCE station, checklist-based cardiovascular history assessment, case-based discussion, reflective feedback, and supervisor observation.

The assessment should focus on whether the student can obtain a complete and relevant history, identify red-flag symptoms, communicate empathetically, involve the attendant appropriately, and report important findings to the supervisor.

6. Entrustment Level and Supervision

The expected level of entrustment is **Level 2**.

At this level, the student may obtain relevant history under direct supervision. The supervisor should be physically present or immediately available to guide, correct, or complete the history where needed.

The student is expected to perform the task with guidance and should not independently make diagnostic or management decisions.

7. Expiration Date

The entrustment decision should be reviewed after one academic year or before progression to a higher level of clinical responsibility.

EPA-2: Perform Basic Cardiovascular Examination in a Patient Presenting with Chest Pain and Palpitations

Level of Entrustment: Level 2

Activity: Perform basic cardiovascular examination

1. Title of the EPA

Perform basic cardiovascular examination in a patient presenting with chest pain and palpitations.

2. Specification and Limitations

This EPA focuses on performing a basic, systematic, and relevant cardiovascular examination in a 17-year-old male presenting with chest discomfort and palpitations.

The encounter includes introducing oneself, confirming patient identity, obtaining consent, ensuring privacy, appropriate exposure, and maintaining a respectful and professional approach throughout the examination.

The examination should include assessment of general condition, including anxiety, sweating, respiratory distress, pallor, cyanosis, and hydration status, followed by recording of vital signs such as pulse, blood pressure, respiratory rate, temperature, and oxygen saturation.

Cardiovascular examination should cover assessment of pulse rate, rhythm, volume, character, and equality of peripheral pulses, along with proper blood pressure measurement to assess hemodynamic stability.

Precordial examination should include assessment of jugular venous pressure, inspection of the precordium, palpation of the apex beat, identification of visible pulsations, heaves or thrills, and auscultation of heart sounds over standard valve areas, including identification of S1, S2, obvious murmurs, or added sounds.

A brief relevant respiratory examination should also be performed, including inspection of breathing pattern and auscultation of both lung fields, to help identify respiratory causes of chest pain such as pneumothorax or respiratory infection.

This EPA is limited to basic cardiovascular examination only. Independent diagnosis of complex arrhythmias, interpretation of advanced cardiac findings, or initiation of emergency management is not expected. Any abnormal or concerning finding must be reported immediately to the supervising clinician.

3. Most Relevant Domains of Competence

The most relevant domains of competence for this EPA are:

Medical Expert / Clinical Reasoner

Communicator

Professional

Collaborator

Health Advocate

4. Required Knowledge, Skills, Attitude, and Behaviour

A. Knowledge

The student should be able to demonstrate knowledge of:

1. Surface anatomy of the heart, including the normal location of the apex beat in the 5th left intercostal space at or near the mid-clavicular line.
2. Anatomical location of standard auscultatory areas, including aortic, pulmonary, tricuspid, and mitral areas.
3. Physiological basis of pulse, heart rate, rhythm, blood pressure, heart sounds, and jugular venous pressure.
4. Normal ranges of pulse, blood pressure, respiratory rate, temperature, and oxygen saturation in an adolescent.
5. Relevance of sinus tachycardia in the context of exertion, anxiety, sympathetic stimulation, pain, and palpitations.
6. Significance of raised JVP, abnormal heart sounds, murmurs, unequal peripheral pulses, hypotension, cyanosis, respiratory distress, low oxygen saturation, and poor peripheral perfusion.
7. Importance of recognizing and escalating red-flag clinical findings in a young patient presenting with chest pain and palpitations.
8. Relevance of examining both cardiovascular and respiratory systems in a patient presenting with chest pain.

B. Skills

The student should be able to:

1. Introduce himself or herself, confirm patient identity, obtain consent, ensure privacy, and position the patient appropriately for cardiovascular examination.
2. Perform hand hygiene before and after examination.
3. Assess the general appearance of the patient, including anxiety, sweating, distress, pallor, cyanosis, and level of consciousness.
4. Measure and interpret vital signs, including pulse, blood pressure, respiratory rate, temperature, and oxygen saturation.
5. Examine the radial pulse for rate, rhythm, volume, and regularity, and compare peripheral pulses where relevant.
6. Assess blood pressure correctly using an appropriate cuff size and proper patient positioning.
7. Assess jugular venous pressure and identify whether it is raised or not.
8. Inspect the precordium for visible pulsations, scars, deformity, or abnormal movements.
9. Palpate the apex beat and confirm whether it is located in the 5th left intercostal space at or near the mid-clavicular line.
10. Palpate for heaves and thrills.
11. Auscultate heart sounds systematically over the mitral, tricuspid, pulmonary, and aortic areas.

12. Identify S1 and S2 and recognize the absence or presence of obvious murmurs or added sounds.
13. Perform a brief relevant respiratory examination, including auscultation of both lung fields for equal air entry and added sounds.
14. Organize examination findings and present them clearly to the supervisor.
15. Identify abnormal or red-flag examination findings and report them immediately to the supervising clinician.

C. Attitude and Behaviour

The student should be able to demonstrate:

1. Respect, empathy, and professionalism while examining an anxious adolescent patient.
2. Clear explanation of each step of the examination in simple language before performing it.
3. Maintenance of patient privacy and dignity during exposure and examination.
4. Gentle handling during precordial examination to avoid unnecessary discomfort.
5. Calm communication to avoid alarming the patient or family.
6. Appropriate response to patient anxiety with reassurance that the examination is being performed to assess his heart and overall condition carefully.
7. Recognition of personal limitations and willingness to seek supervision when uncertain about examination findings.
8. Patient safety awareness by promptly escalating concerning findings such as hypotension, irregular pulse, syncope, cyanosis, severe breathlessness, raised JVP, absent peripheral pulses, or abnormal heart sounds.

5. Assessment Information Sources

Progress and entrustment decision may be assessed through direct observation of cardiovascular examination in a simulated or real clinical setting.

The student may be assessed through OSCE station, Mini-CEX, checklist-based cardiovascular examination assessment, case-based discussion, supervisor feedback, and reflective assessment.

The assessment should focus on whether the student can perform a systematic cardiovascular examination, measure vital signs correctly, identify normal and abnormal findings, maintain patient dignity, communicate appropriately, and report relevant findings to the supervisor.

6. Entrustment Level and Supervision

The expected level of entrustment is Level 2.

At this level, the student may perform a basic cardiovascular examination under direct supervision. The supervisor should be physically present or immediately available to guide, correct, or complete the examination where needed.

The student is expected to perform the examination with guidance and should not independently make final diagnostic or management decisions.

7. Expiration Date

The entrustment decision should be reviewed after one academic year or before progression to a higher level of clinical responsibility.

EPA-3: Interpret Basic Clinical Findings in a Patient Presenting with Chest Pain and Palpitations

Level of Entrustment: Level 2

Activity: Interpret basic clinical findings and differentiate common non-life-threatening causes from potentially serious causes of chest pain using an integrated clinical reasoning approach.

1. Title of the EPA

Interpret basic clinical findings including pulse, blood pressure, JVP, heart sounds, ECG, and chest X-ray in a patient presenting with chest pain and palpitations.

2. Specification and Limitations

This EPA focuses on basic interpretation of clinical findings in a 17-year-old male presenting with sudden onset chest discomfort and palpitations after exertion.

The task includes integration of history, physical examination, ECG, chest X-ray, and basic laboratory findings to determine whether the patient is clinically stable and whether the presentation suggests a common non-life-threatening cause or a potentially serious cardiac or respiratory condition.

Clinical interpretation should include recognition of pulse rate of 112 beats/minute as tachycardia and correlation with exertion, anxiety, sympathetic stimulation, and palpitations. Normal blood pressure, oxygen saturation, JVP, peripheral pulses, audible S1 and S2, absence of obvious murmur, and clear breath sounds should be identified as reassuring findings.

ECG interpretation should include recognition of sinus tachycardia, normal QRS duration, and absence of acute ST-segment elevation, making acute ST-elevation myocardial infarction or broad-complex tachyarrhythmia less likely in the given context.

Chest X-ray interpretation should include identification of normal cardiac shadow, absence of pneumothorax, and absence of mediastinal widening, reducing the likelihood of cardiomegaly, pneumothorax, or acute mediastinal pathology.

Basic laboratory interpretation should include correlation of normal hemoglobin, random blood glucose, serum electrolytes, and non-raised cardiac enzymes with reduced likelihood of anemia, hypoglycemia, electrolyte-related arrhythmia, or acute myocardial injury.

The learner should differentiate common non-life-threatening causes, such as exertional sinus tachycardia, anxiety-related palpitations, musculoskeletal chest discomfort, dehydration, caffeine-related symptoms, and stress-related symptoms, from potentially serious causes such as arrhythmia, myocarditis, hypertrophic cardiomyopathy, congenital or inherited cardiac disease, pulmonary embolism, pneumothorax, or acute coronary syndrome.

This EPA is limited to basic interpretation and early clinical reasoning only. Independent final diagnosis, prescription of treatment, discharge decision, or management of acute cardiac emergencies is not expected. Any abnormal or red-flag finding must be reported immediately to the supervising clinician.

3. Most Relevant Domains of Competence

The most relevant domains of competence for this EPA are:

Medical Expert / Clinical Reasoner

Communicator

Professional

Collaborator

Health Advocate

Scholar

4. Required Knowledge, Skills, Attitude, and Behaviour

4. Required Knowledge, Skills, Attitude, and Behaviour

A. Knowledge

The student should be able to demonstrate knowledge of:

1. Normal ranges and clinical significance of vital signs, including pulse, blood pressure, respiratory rate, temperature, and oxygen saturation.
2. Physiological basis of sinus tachycardia, exertional palpitations, sympathetic stimulation, anxiety, and increased cardiac workload.
3. Basic interpretation of cardiovascular findings including pulse rhythm, JVP, S1/S2, murmurs, blood pressure, and oxygen saturation.
4. Basic ECG and chest X-ray findings relevant to chest pain and palpitations, including sinus rhythm, QRS duration, ST-segment changes, cardiac size, pneumothorax, and mediastinal widening.
5. Relevance of basic laboratory tests including hemoglobin, blood glucose, electrolytes, and cardiac enzymes.
6. Common non-life-threatening and potentially serious causes of chest pain and palpitations in adolescents.
7. Red flags requiring urgent escalation, including syncope, exertional chest pain, abnormal ECG, murmur, hypotension, cyanosis, raised JVP, unequal pulses, and family history of sudden cardiac death.

B. Skills

The student should be able to:

1. Interpret pulse, blood pressure, oxygen saturation, JVP, and heart sounds in relation to clinical stability.
2. Identify sinus tachycardia, normal QRS duration, rhythm regularity, and absence or presence of acute ST-segment changes on ECG.
3. Interpret chest X-ray for cardiac shadow, lung fields, pneumothorax, and mediastinal widening.
4. Interpret basic laboratory findings and relate them to possible causes of chest pain and palpitations.
5. Integrate history, examination, ECG, chest X-ray, and laboratory findings to decide whether the patient appears stable or unstable.

6. Differentiate likely non-life-threatening causes from potentially serious causes using basic clinical reasoning.
7. Present findings clearly to the supervisor and identify red flags requiring urgent escalation.

C. Attitude and Behaviour

The student should be able to demonstrate:

1. A cautious and patient-safe approach while interpreting chest pain and palpitations in a young patient.
2. Avoidance of dismissing symptoms as anxiety without considering red flags and clinical findings.
3. Calm, respectful, and reassuring communication with the patient and father.
4. Balanced reassurance based on normal findings without giving false assurance or making independent final decisions.
5. Recognition of personal limitations and willingness to seek supervision when uncertain.
6. Professionalism while discussing potentially serious conditions without creating unnecessary fear.
7. Maintenance of patient dignity, confidentiality, and respect during discussion of clinical findings.

5. Assessment Information Sources

Progress and entrustment decision may be assessed through direct observation of student performance during case-based discussion, bedside teaching, simulated clinical encounter, or early clinical exposure session.

The student may be assessed through OSCE station, Mini-CEX, case-based discussion, viva voce, ECG and chest X-ray interpretation exercise, checklist-based assessment, reflective discussion, and supervisor feedback.

The assessment should focus on whether the student can interpret basic clinical findings, integrate history and examination with investigations, identify red flags, differentiate common non-life-threatening causes from potentially serious causes, communicate appropriately, and escalate concerns to the supervisor.

6. Entrustment Level and Supervision

The expected level of entrustment is Level 2.

At this level, the student may interpret basic clinical findings under direct supervision. The supervisor should be physically present or immediately available to guide interpretation, correct errors, and ensure patient safety.

The student may discuss possible differential diagnoses and clinical reasoning but should not independently make a final diagnosis, discharge decision, or management plan.

7. Expiration Date

The entrustment decision should be reviewed after one academic year or before progression to a higher level of clinical responsibility.

THEME 2: A Patient with Raised Blood Pressure, Edema & Breathlessness

EPA-1: Perform Basic Cardiovascular and Respiratory Examination in a Patient with Raised Blood Pressure, Edema, and Breathlessness

Level of Entrustment: Level 2

Activity: Perform basic cardiovascular and respiratory examination

1. Title of the EPA

Perform basic cardiovascular and respiratory examination in a patient presenting with raised blood pressure, edema, and breathlessness.

2. Specification and Limitations

This EPA focuses on performing a basic, systematic, and relevant cardiovascular and respiratory examination in a patient presenting with raised blood pressure, edema, and breathlessness.

The encounter includes introducing oneself, confirming patient identity, obtaining consent, ensuring privacy, appropriate exposure, and maintaining a respectful and professional approach throughout the examination.

The examination should include assessment of general condition, including respiratory distress, anxiety, pallor, cyanosis, sweating, peripheral edema, and level of consciousness, followed by recording of vital signs such as pulse, blood pressure, respiratory rate, temperature, and oxygen saturation.

Cardiovascular examination should include assessment of pulse rate, rhythm, volume, character, peripheral pulses, blood pressure measurement, jugular venous pressure, precordial inspection, palpation of apex beat, heaves or thrills, and auscultation of heart sounds over standard valve areas, including identification of S1, S2, murmurs, or added sounds.

Respiratory examination should include inspection of breathing pattern, chest movement, use of accessory muscles, palpation for tracheal position and chest expansion, percussion where relevant, and auscultation for breath sounds and added sounds such as basal crepitations or wheeze.

Assessment of edema should include inspection and palpation for peripheral pitting edema, site, extent, symmetry, and severity, with correlation to possible cardiovascular or renal causes.

This EPA is limited to basic cardiovascular and respiratory examination only. Independent diagnosis, interpretation of advanced cardiac or respiratory findings, prescription of treatment, or initiation of emergency management is not expected. Any abnormal or concerning finding must be reported immediately to the supervising clinician.

3. Most Relevant Domains of Competence

The most relevant domains of competence for this EPA are:

Medical Expert / Clinical Reasoner
Communicator
Professional
Collaborator
Health Advocate

4. Required Knowledge, Skills, Attitude, and Behaviour

A. Knowledge

The student should be able to demonstrate knowledge of:

1. Surface anatomy of the heart, apex beat, standard auscultatory areas, lung fields, and anatomical basis of cardiovascular and respiratory examination.
2. Physiological basis of pulse, blood pressure, jugular venous pressure, heart sounds, respiratory rate, oxygen saturation, and breath sounds.
3. Clinical significance of raised blood pressure, tachycardia or irregular pulse, raised JVP, abnormal heart sounds, murmurs, peripheral edema, cyanosis, low oxygen saturation, and respiratory distress.
4. Common causes of breathlessness and edema, including cardiac failure, renal disease, respiratory disease, anemia, and fluid overload.
5. Relationship between hypertension, increased cardiac workload, fluid retention, edema, pulmonary congestion, and breathlessness.
6. Red-flag examination findings requiring urgent escalation, including severe breathlessness, hypotension or very high blood pressure, cyanosis, low oxygen saturation, altered consciousness, raised JVP, absent or unequal pulses, severe edema, basal crepitations, or abnormal heart sounds.

B. Skills

The student should be able to:

1. Introduce himself or herself, confirm patient identity, obtain consent, ensure privacy, perform hand hygiene, and position the patient appropriately.
2. Assess general condition, respiratory distress, pallor, cyanosis, sweating, peripheral edema, hydration status, and level of consciousness.
3. Measure and interpret vital signs, including pulse, blood pressure, respiratory rate, temperature, and oxygen saturation.
4. Examine pulse, peripheral pulses, blood pressure, JVP, precordium, apex beat, heaves, thrills, heart sounds, murmurs, and added cardiac sounds.
5. Perform basic respiratory examination, including inspection, palpation, percussion where relevant, and auscultation for breath sounds, basal crepitations, and wheeze.
6. Assess edema for site, extent, symmetry, pitting nature, and severity.
7. Organize and present examination findings clearly to the supervisor and immediately report abnormal or red-flag findings.

C. Attitude and Behaviour

The student should be able to demonstrate:

1. Respect, empathy, and professionalism while examining a patient with breathlessness and edema.
2. Clear explanation of each step of examination in simple language before performing it.

3. Maintenance of patient privacy, dignity, and comfort during exposure and examination.
4. Gentle handling during cardiovascular, respiratory, and edema examination.
5. Calm communication to reduce patient anxiety and avoid unnecessary alarm.
6. Recognition of personal limitations and willingness to seek supervision when uncertain.
7. Patient safety awareness by promptly escalating concerning findings to the supervising clinician.

5. Assessment Information Sources

Progress and entrustment decision may be assessed through direct observation of cardiovascular and respiratory examination in a simulated or real clinical setting.

The student may be assessed through OSCE station, Mini-CEX, checklist-based clinical examination assessment, case-based discussion, supervisor feedback, and reflective assessment.

The assessment should focus on whether the student can perform a systematic cardiovascular and respiratory examination, measure vital signs correctly, assess edema appropriately, identify normal and abnormal findings, maintain patient dignity, communicate appropriately, and report relevant findings to the supervisor.

6. Entrustment Level and Supervision

The expected level of entrustment is **Level 2**.

At this level, the student may perform a basic cardiovascular and respiratory examination under direct supervision. The supervisor should be physically present or immediately available to guide, correct, or complete the examination where needed.

The student is expected to perform the examination with guidance and should not independently make final diagnostic or management decisions.

7. Expiration Date

The entrustment decision should be reviewed after one academic year or before progression to a higher level of clinical responsibility.

EPA-2: Interpret Blood Pressure, Pulse, JVP, Heart Sounds, Edema, ECG, Chest X-ray, and Basic Laboratory Findings Using Integrated Basic Science Knowledge

Level of Entrustment: Level 2

Activity: Interpret basic clinical and investigation findings

1. Title of the EPA

Interpret blood pressure, pulse, JVP, heart sounds, edema, ECG, chest X-ray, and basic laboratory findings in a patient presenting with raised blood pressure, edema, and breathlessness.

2. Specification and Limitations

This EPA focuses on basic interpretation of clinical and investigation findings in a patient presenting with raised blood pressure, edema, and breathlessness.

The task includes integration of history, physical examination, ECG, chest X-ray, and basic laboratory findings to determine whether the patient is clinically stable and whether the presentation suggests cardiovascular, renal, respiratory, or metabolic involvement.

Clinical interpretation should include assessment of raised blood pressure, pulse rate and rhythm, jugular venous pressure, heart sounds, murmurs or added sounds, peripheral edema, respiratory rate, and oxygen saturation.

The learner should be able to relate raised blood pressure to increased vascular resistance, increased cardiac workload, and possible end-organ effects. Edema and breathlessness should be correlated with fluid retention, venous congestion, pulmonary congestion, cardiac dysfunction, renal involvement, or respiratory disease.

ECG interpretation should include recognition of basic rhythm, rate, QRS duration, ST-segment changes, and features suggestive of strain, ischemia, arrhythmia, or chamber enlargement at a basic level.

Chest X-ray interpretation should include assessment of cardiac shadow, lung fields, pulmonary congestion, pleural effusion, pneumothorax, and other obvious respiratory abnormalities relevant to breathlessness.

Basic laboratory interpretation should include correlation of hemoglobin, serum electrolytes, renal function tests, blood glucose, urine examination, and cardiac enzymes where available, with possible causes and complications of raised blood pressure, edema, and breathlessness.

The learner should differentiate common non-life-threatening or chronic causes, such as poorly controlled hypertension, mild fluid retention, obesity-related breathlessness, anemia, or lifestyle-related risk factors, from potentially serious conditions such as hypertensive emergency, heart failure, renal failure, acute coronary syndrome, significant arrhythmia, pulmonary edema, pulmonary embolism, or severe respiratory disease.

This EPA is limited to basic interpretation and early clinical reasoning only. Independent final diagnosis, prescription of treatment, discharge decision, or management of acute cardiovascular, renal, or respiratory emergencies is not expected. Any abnormal or red-flag finding must be reported immediately to the supervising clinician.

3. Most Relevant Domains of Competence

The most relevant domains of competence for this EPA are:

Medical Expert / Clinical Reasoner
Communicator
Professional
Collaborator
Health Advocate
Scholar

4. Required Knowledge, Skills, Attitude, and Behaviour

A. Knowledge

The student should be able to demonstrate knowledge of:

1. Normal ranges and clinical significance of blood pressure, pulse, respiratory rate, oxygen saturation, JVP, heart sounds, and peripheral edema.
2. Physiological basis of hypertension, cardiac workload, venous congestion, fluid retention, pulmonary congestion, and breathlessness.
3. Basic interpretation of cardiovascular findings, including raised blood pressure, pulse abnormalities, raised JVP, murmurs, added heart sounds, and pitting edema.
4. Basic ECG and chest X-ray findings relevant to hypertension, breathlessness, and edema, including rhythm, rate, QRS duration, ST-segment changes, cardiac size, pulmonary congestion, pleural effusion, and lung field abnormalities.
5. Relevance of basic laboratory tests, including hemoglobin, renal function tests, serum electrolytes, blood glucose, urine examination, and cardiac enzymes.
6. Common causes of raised blood pressure, edema, and breathlessness, including hypertension, heart failure, renal disease, anemia, respiratory disease, and fluid overload.
7. Red flags requiring urgent escalation, including very high blood pressure with symptoms, chest pain, severe breathlessness, low oxygen saturation, altered consciousness, raised JVP, pulmonary edema, abnormal ECG, reduced urine output, severe edema, or abnormal renal function tests.

B. Skills

The student should be able to:

1. Interpret blood pressure, pulse, respiratory rate, oxygen saturation, JVP, heart sounds, and edema in relation to clinical stability.
2. Identify abnormal clinical findings such as severe hypertension, irregular pulse, raised JVP, murmurs, added heart sounds, pitting edema, cyanosis, or respiratory distress.

3. Interpret ECG at a basic level by identifying rhythm, rate, QRS duration, ST-segment changes, and obvious arrhythmias or strain patterns.
4. Interpret chest X-ray at a basic level by identifying cardiac shadow, lung fields, pulmonary congestion, pleural effusion, pneumothorax, or other obvious abnormalities.
5. Interpret basic laboratory findings and relate hemoglobin, renal function, electrolytes, blood glucose, urine findings, and cardiac enzymes to the clinical presentation.
6. Integrate history, examination, ECG, chest X-ray, and laboratory findings to differentiate stable from unstable patients and likely benign from potentially serious causes.
7. Present findings clearly to the supervisor and identify red flags requiring urgent escalation.

C. Attitude and Behaviour

The student should be able to demonstrate:

1. A cautious and patient-safe approach while interpreting raised blood pressure, edema, and breathlessness.
2. Avoidance of dismissing symptoms as minor without considering cardiac, renal, respiratory, or metabolic causes.
3. Calm, respectful, and reassuring communication with the patient and attendants.
4. Balanced explanation of findings without causing unnecessary fear or giving false assurance.
5. Recognition of personal limitations and willingness to seek supervision when uncertain.
6. Professionalism while discussing potentially serious conditions and investigation findings.
7. Maintenance of patient dignity, confidentiality, and respect during discussion of clinical findings.

5. Assessment Information Sources

Progress and entrustment decision may be assessed through direct observation during case-based discussion, bedside teaching, simulated clinical encounter, or early clinical exposure session.

The student may be assessed through OSCE station, Mini-CEX, case-based discussion, viva voce, ECG and chest X-ray interpretation exercise, laboratory data interpretation exercise, checklist-based assessment, reflective discussion, and supervisor feedback.

The assessment should focus on whether the student can interpret basic clinical findings, integrate examination findings with ECG, chest X-ray, and laboratory results, identify red flags, differentiate common causes from serious conditions, communicate appropriately, and escalate concerns to the supervisor.

6. Entrustment Level and Supervision

The expected level of entrustment is **Level 2**.

At this level, the student may interpret basic clinical and investigation findings under direct supervision. The supervisor should be physically present or immediately available to guide interpretation, correct errors, and ensure patient safety.

The student may discuss possible differential diagnoses and clinical reasoning but should not independently make a final diagnosis, discharge decision, prescription, or management plan.

7. Expiration Date

The entrustment decision should be reviewed after one academic year or before progression to a higher level of clinical responsibility.

EPA-3: Communicate the Importance of Blood Pressure Control, Medication Adherence, Salt Restriction, and Lifestyle Modification to the Patient

Level of Entrustment: Level 2–3

Activity: Patient communication and health education

1. Title of the EPA

Communicate the importance of blood pressure control, medication adherence, salt restriction, and lifestyle modification to a patient presenting with raised blood pressure, edema, and breathlessness.

2. Specification and Limitations

This EPA focuses on effective communication with a patient presenting with raised blood pressure, edema, and breathlessness, using simple, respectful, and patient-friendly language.

The task includes explaining the importance of controlling blood pressure to reduce strain on the heart, blood vessels, kidneys, and lungs. The patient should be helped to understand that uncontrolled blood pressure may contribute to fluid retention, edema, breathlessness, heart failure, kidney damage, stroke, or other complications.

The encounter should include counseling regarding regular use of prescribed medicines, avoidance of self-discontinuation, and the need to follow the treatment plan advised by the physician.

The learner should explain the role of salt restriction in reducing fluid retention, swelling, and breathlessness. Lifestyle advice should include healthy diet, regular physical activity according to medical advice, weight control, avoidance of smoking, reduction of stress, adequate sleep, and regular follow-up.

The communication should be interactive, allowing the patient to ask questions and express concerns. The learner should check patient understanding and encourage adherence in a non-judgmental manner.

This EPA is limited to basic patient education and counseling under supervision. Independent prescription, change of medication, advanced dietary planning, or management of acute cardiovascular, renal, or respiratory emergencies is not expected. Any warning symptoms or patient concerns must be reported to the supervising clinician.

3. Most Relevant Domains of Competence

The most relevant domains of competence for this EPA are:

Communicator
Health Advocate
Professional
Medical Expert / Clinical Reasoner
Collaborator

4. Required Knowledge, Skills, Attitude, and Behaviour

A. Knowledge

The student should be able to demonstrate knowledge of:

1. Basic meaning of raised blood pressure and its effect on the heart, blood vessels, kidneys, brain, and lungs.
2. Relationship between uncontrolled hypertension, fluid retention, edema, breathlessness, heart failure, kidney disease, and stroke.
3. Importance of regular medication use, follow-up, and avoiding self-discontinuation of antihypertensive medicines.
4. Role of salt restriction in controlling blood pressure, reducing fluid overload, and improving edema and breathlessness.
5. Key lifestyle measures, including healthy diet, weight control, physical activity, smoking cessation, stress reduction, adequate sleep, and limiting unhealthy foods.
6. Warning symptoms requiring urgent medical attention, including severe breathlessness, chest pain, fainting, severe headache, weakness of one side of the body, reduced urine output, or worsening swelling.

B. Skills

The student should be able to:

1. Explain blood pressure control and its importance in simple, clear, and non-technical language.
2. Counsel the patient regarding regular medication intake, adherence to physician advice, and follow-up visits.
3. Explain salt restriction and practical dietary measures, including avoiding extra table salt, salty snacks, processed foods, and high-salt pickles or sauces.
4. Communicate lifestyle advice according to the patient's condition, including appropriate physical activity, weight control, smoking avoidance, stress management, and sleep hygiene.

5. Use an interactive approach by listening to patient concerns, asking about barriers to adherence, and encouraging questions.
6. Check patient understanding by asking the patient to repeat key advice in his or her own words.
7. Identify warning symptoms and advise the patient to seek urgent medical help when needed, while informing the supervisor of important concerns.

C. Attitude and Behaviour

The student should be able to demonstrate:

1. Empathy, respect, and patience while counseling a patient with raised blood pressure, edema, and breathlessness.
2. Non-judgmental communication regarding medication adherence, diet, weight, smoking, or lifestyle habits.
3. Culturally appropriate counseling using examples relevant to the patient's daily routine and diet.
4. Balanced reassurance without minimizing the seriousness of uncontrolled blood pressure.
5. Professional behaviour by avoiding independent changes in medication or treatment advice beyond the learner's role.
6. Respect for patient autonomy, privacy, dignity, and confidentiality during counseling.
7. Willingness to seek guidance from the supervising clinician when the patient asks about treatment changes, worsening symptoms, or emergency concerns.

5. Assessment Information Sources

Progress and entrustment decision may be assessed through direct observation of patient counseling in a simulated or real clinical encounter.

The student may be assessed through OSCE station, Mini-CEX, role play, counseling checklist, case-based discussion, reflective assessment, and supervisor feedback.

The assessment should focus on whether the student can explain blood pressure control, medication adherence, salt restriction, and lifestyle modification in simple language, respond to patient concerns, check understanding, maintain professionalism, and identify warning symptoms requiring escalation.

6. Entrustment Level and Supervision

The expected level of entrustment is **Level 2–3**.

At **Level 2**, the student may counsel the patient under direct supervision, with the supervisor present or immediately available to guide and correct the communication.

At **Level 3**, the student may provide basic counseling with indirect supervision, provided that the supervisor remains available and reviews the key messages delivered to the patient.

The student is not expected to independently prescribe, change medication, or make final management decisions.

7. Expiration Date

The entrustment decision should be reviewed after one academic year or before progression to a higher level of clinical responsibility.

THEME 3: A Patient with Exertional Dyspnea & Exercise Intolerance

EPA-1: Obtain Focused History and Perform Basic Cardiovascular Examination in a Patient with Exertional Dyspnea and Exercise Intolerance

Level of Entrustment: Level 2

Activity: Focused history taking and basic cardiovascular examination

1. Title of the EPA

Obtain focused history and perform basic cardiovascular examination in a pregnant patient presenting with exertional dyspnea, reduced exercise tolerance, and palpitations.

2. Specification and Limitations

This EPA focuses on obtaining a focused history and performing a basic, systematic cardiovascular examination in a 38-year-old pregnant woman presenting with progressive shortness of breath on exertion, reduced exercise tolerance, easy fatigability, occasional palpitations, mild chest heaviness, systolic murmur, mild pedal edema, and slightly delayed femoral pulse.

The encounter includes introducing oneself, confirming patient identity, obtaining consent, ensuring privacy, and maintaining respectful and professional communication with the patient and her family.

Focused history should include onset, duration, progression, severity, and triggers of breathlessness, especially its relation to exertion and pregnancy. Associated symptoms such as palpitations, chest heaviness, fatigue, syncope, orthopnea, paroxysmal nocturnal dyspnea, pedal edema, cough, wheezing, hemoptysis, fever, and recent respiratory infection should be explored.

Relevant past history should include childhood history of heart murmur, known congenital or acquired heart disease, hypertension, anemia, rheumatic fever, previous cardiac evaluation, medication use, previous pregnancies, obstetric complications, and family history of cardiac disease.

Cardiovascular examination should include assessment of general appearance, pallor, anxiety, respiratory distress, pedal edema, pulse, blood pressure, jugular venous pressure, precordial inspection, palpation of apex beat, assessment of heaves or thrills, auscultation of S1 and S2, and identification of murmur. Peripheral pulses should be assessed, including comparison of radial and femoral pulses.

This EPA is limited to focused history taking and basic cardiovascular examination only. Independent diagnosis, interpretation of advanced cardiac findings, prescription of treatment, obstetric decision-making, or emergency management is not expected. Any abnormal or concerning finding must be reported immediately to the supervising clinician.

3. Most Relevant Domains of Competence

The most relevant domains of competence for this EPA are:

Medical Expert / Clinical Reasoner
Communicator
Professional
Collaborator
Health Advocate

4. Required Knowledge, Skills, Attitude, and Behaviour

A. Knowledge

The student should be able to demonstrate knowledge of:

1. Cardiovascular changes during pregnancy, including increased blood volume, heart rate, cardiac output, and myocardial workload.
2. Basic causes of exertional dyspnea and reduced exercise tolerance in pregnancy, including physiological changes, anemia, valvular disease, congenital heart disease, cardiomyopathy, and hypertension-related cardiac strain.
3. Clinical significance of childhood heart murmur, systolic murmur, forceful apex beat, pedal edema, pallor, and delayed femoral pulse.
4. Anatomical and physiological basis of pulse, blood pressure, JVP, apex beat, heart sounds, murmurs, and peripheral pulse delay.
5. Relationship between anemia, pregnancy, increased cardiac workload, exertional palpitations, fatigue, and breathlessness.
6. Red flags requiring urgent escalation, including worsening breathlessness, chest pain, syncope, cyanosis, raised JVP, severe edema, abnormal pulse, significant murmur, oxygen desaturation, or features suggestive of maternal cardiac compromise.

B. Skills

The student should be able to:

1. Introduce himself or herself, confirm patient identity, obtain consent, ensure privacy, and establish rapport with the pregnant patient and her family.
2. Take focused history of dyspnea, exercise intolerance, fatigue, palpitations, chest heaviness, edema, syncope, orthopnea, and paroxysmal nocturnal dyspnea.
3. Explore relevant negative history, including absence of fever, cough, wheezing, hemoptysis, recent respiratory infection, and known congenital heart disease.
4. Obtain relevant past, obstetric, drug, family, and social history, including childhood murmur, previous cardiac evaluation, hypertension, anemia, pregnancy-related symptoms, and medication use.
5. Assess general condition, anxiety, pallor, respiratory distress, pedal edema, pulse, blood pressure, respiratory rate, oxygen saturation, and JVP.
6. Perform basic cardiovascular examination, including precordial inspection, palpation of apex beat, assessment for heaves or thrills, auscultation of heart sounds, and identification of systolic murmur.
7. Assess peripheral pulses and compare radial and femoral pulses for delay, then organize and present findings clearly to the supervisor.

C. Attitude and Behaviour

The student should be able to demonstrate:

1. Empathy and sensitivity toward a pregnant patient worried about her own health and the well-being of her baby.
2. Respectful, calm, and non-alarming communication with the patient and her family.
3. Appropriate reassurance without dismissing symptoms or giving false assurance.
4. Maintenance of privacy, dignity, and comfort during history taking and examination.
5. Gentle and professional conduct during cardiovascular examination, especially in pregnancy.
6. Recognition of personal limitations and willingness to seek supervision when abnormal findings are identified.
7. Patient safety awareness by promptly escalating concerning symptoms or signs to the supervising clinician.

5. Assessment Information Sources

Progress and entrustment decision may be assessed through direct observation of focused history taking and cardiovascular examination in a simulated or real clinical setting.

The student may be assessed through OSCE station, Mini-CEX, checklist-based clinical examination assessment, case-based discussion, supervisor feedback, and reflective assessment.

The assessment should focus on whether the student can obtain relevant focused history, perform systematic cardiovascular examination, recognize important clinical findings, maintain patient dignity, communicate appropriately, and report abnormal or red-flag findings to the supervisor.

6. Entrustment Level and Supervision

The expected level of entrustment is **Level 2**.

At this level, the student may obtain focused history and perform basic cardiovascular examination under direct supervision. The supervisor should be physically present or immediately available to guide, correct, or complete the encounter where needed.

The student is expected to perform the task with guidance and should not independently make final diagnostic, obstetric, or management decisions.

7. Expiration Date

The entrustment decision should be reviewed after one academic year or before progression to a higher level of clinical responsibility.

EPA-2: Interpret Pulse Findings, Blood Pressure, Murmur, ECG, Echocardiography, and Basic Laboratory Findings Using Integrated Basic Science Knowledge

Level of Entrustment: Level 2

Activity: Interpretation of clinical and investigation findings

1. Title of the EPA

Interpret pulse findings, blood pressure, murmur, ECG, echocardiography, and basic laboratory findings in a pregnant patient with exertional dyspnea and exercise intolerance.

2. Specification and Limitations

This EPA focuses on basic interpretation of clinical and investigation findings in a 38-year-old pregnant woman presenting with progressive exertional dyspnea, reduced exercise tolerance, palpitations, mild chest heaviness, systolic murmur, mild anemia, pedal edema, and slightly delayed femoral pulse.

The task includes integration of history, cardiovascular examination, pulse findings, blood pressure, ECG, echocardiography, chest imaging, complete blood count, lipid profile, and obstetric assessment to determine whether the patient is clinically stable and whether the presentation suggests cardiovascular, hematological, or pregnancy-related contribution.

Clinical interpretation should include recognition of sinus tachycardia, mildly raised blood pressure, systolic murmur, slightly forceful apex beat, mild pedal edema, and radial-femoral pulse delay. These findings should be correlated with increased cardiovascular workload during pregnancy and the possibility of underlying structural heart disease.

ECG interpretation should include recognition of sinus tachycardia, features suggestive of left ventricular strain, and absence of acute ST-segment elevation. Echocardiography and imaging findings should be interpreted at a basic level, including mild cardiac enlargement, increased left ventricular workload, absence of gross pulmonary pathology, and possible narrowing of the aortic arch region.

Laboratory interpretation should include recognition of mild anemia as a contributor to fatigue, tachycardia, and breathlessness. Lipid profile abnormalities should be related to cardiovascular risk, while obstetric findings should be considered in relation to maternal cardiovascular status and fetal well-being.

The learner should differentiate common and pregnancy-related causes such as physiological dyspnea of pregnancy, anemia, deconditioning, anxiety, and mild fluid retention from potentially serious causes such as congenital heart disease, valvular heart disease, coarctation of aorta, cardiomyopathy, hypertensive heart disease, heart failure, arrhythmia, pulmonary embolism, or acute coronary syndrome.

This EPA is limited to basic interpretation and early clinical reasoning only. Independent final diagnosis, prescription of treatment, obstetric decision-making, discharge decision, or management of acute cardiovascular or obstetric emergencies is not expected. Any abnormal or red-flag finding must be reported immediately to the supervising clinician.

3. Most Relevant Domains of Competence

The most relevant domains of competence for this EPA are:

Medical Expert / Clinical Reasoner
Communicator
Professional
Collaborator
Health Advocate
Scholar

4. Required Knowledge, Skills, Attitude, and Behaviour

A. Knowledge

The student should be able to demonstrate knowledge of:

1. Cardiovascular changes during pregnancy, including increased blood volume, heart rate, cardiac output, and myocardial workload.
2. Clinical significance of tachycardia, raised blood pressure, systolic murmur, forceful apex beat, pedal edema, and delayed femoral pulse.
3. Basic physiological basis of exertional dyspnea, exercise intolerance, palpitations, anemia-related fatigue, and left ventricular strain.
4. Basic ECG and echocardiographic findings relevant to this case, including sinus tachycardia, left ventricular strain, cardiac enlargement, and increased left ventricular workload.
5. Possible significance of radial-femoral delay and suspected narrowing of the aortic arch region in relation to obstructive congenital cardiovascular disease.
6. Relevance of complete blood count, lipid profile, and obstetric assessment in evaluating maternal cardiovascular status.
7. Red flags requiring urgent escalation, including worsening dyspnea, chest pain, syncope, cyanosis, oxygen desaturation, significant murmur, uncontrolled blood pressure, abnormal ECG, heart failure signs, or fetal distress.

B. Skills

The student should be able to:

1. Interpret pulse rate, rhythm, blood pressure, respiratory rate, oxygen saturation, JVP, apex beat, murmur, edema, and peripheral pulse delay in relation to clinical stability.
2. Correlate exertional dyspnea, palpitations, fatigue, chest heaviness, systolic murmur, and delayed femoral pulse with possible underlying cardiovascular disease.
3. Interpret ECG at a basic level by identifying sinus tachycardia, left ventricular strain features, rhythm regularity, and absence of acute ST-segment elevation.
4. Interpret echocardiography and chest imaging at a basic level by identifying cardiac enlargement, increased left ventricular workload, absence of gross pulmonary pathology, and possible aortic arch narrowing.
5. Interpret mild anemia and lipid profile abnormalities in relation to fatigue, breathlessness, tachycardia, pregnancy, and cardiovascular risk.
6. Integrate clinical, investigation, and obstetric findings to differentiate physiological pregnancy-related symptoms from potentially serious cardiovascular causes.
7. Present findings clearly to the supervisor and identify red flags requiring urgent escalation.

C. Attitude and Behaviour

The student should be able to demonstrate:

1. A cautious and patient-safe approach while interpreting dyspnea and cardiovascular findings in pregnancy.
2. Avoidance of dismissing symptoms as normal pregnancy changes without considering red flags and abnormal findings.
3. Calm, respectful, and reassuring communication with the patient and family.
4. Balanced explanation of findings without creating unnecessary fear or giving false assurance.
5. Recognition of personal limitations and willingness to seek supervision when uncertain.
6. Professionalism while discussing possible maternal cardiovascular risk and need for further evaluation.

7. Maintenance of patient dignity, confidentiality, and respect during discussion of clinical and investigation findings.

5. Assessment Information Sources

Progress and entrustment decision may be assessed through direct observation during case-based discussion, bedside teaching, simulated clinical encounter, or early clinical exposure session.

The student may be assessed through OSCE station, Mini-CEX, case-based discussion, viva voce, ECG and echocardiography interpretation exercise, laboratory data interpretation exercise, checklist-based assessment, reflective discussion, and supervisor feedback.

The assessment should focus on whether the student can interpret clinical findings and investigations, integrate basic science knowledge with clinical reasoning, identify red flags, differentiate physiological pregnancy-related symptoms from serious cardiovascular disease, communicate appropriately, and escalate concerns to the supervisor.

6. Entrustment Level and Supervision

The expected level of entrustment is **Level 2**.

At this level, the student may interpret basic clinical and investigation findings under direct supervision. The supervisor should be physically present or immediately available to guide interpretation, correct errors, and ensure patient safety.

The student may discuss possible differential diagnoses and clinical reasoning but should not independently make a final diagnosis, discharge decision, prescription, obstetric decision, or management plan.

7. Expiration Date

The entrustment decision should be reviewed after one academic year or before progression to a higher level of clinical responsibility.

EPA-3: Communicate Risk, Need for Further Evaluation, and Follow-up Plan Empathetically to a Pregnant Patient and Her Family

Level of Entrustment: Level 2–3

Activity: Patient communication, counseling, and health education

1. Title of the EPA

Communicate risk, need for further evaluation, and follow-up plan empathetically to a pregnant patient with exertional dyspnea and suspected cardiovascular disease.

2. Specification and Limitations

This EPA focuses on communicating with a 38-year-old pregnant patient and her family in a clear, empathetic, and non-alarming manner regarding exertional dyspnea, exercise intolerance, palpitations, systolic murmur, mild anemia, and possible underlying cardiovascular disease.

The task includes explaining that breathlessness in pregnancy may occur due to normal physiological changes, but progressive symptoms, reduced exercise tolerance, murmur, ECG changes, mild cardiac enlargement, and delayed femoral pulse require further cardiovascular evaluation.

The learner should explain the need for follow-up with relevant specialists, including cardiology and obstetrics, to assess maternal cardiovascular status and ensure fetal well-being. The importance of echocardiography, blood pressure monitoring, anemia management, and review of investigation findings should be communicated in simple language.

Counseling should include warning symptoms that require urgent medical attention, such as worsening breathlessness, chest pain, fainting, bluish discoloration, severe palpitations, marked swelling, reduced urine output, severe headache, or reduced fetal movements.

The communication should be interactive, allowing the patient to express fears about her own health and the baby. The learner should acknowledge the patient's concern: "Is my heart not able to support my body and my baby?" and provide balanced reassurance without dismissing the risk.

This EPA is limited to basic counseling and communication under supervision. Independent diagnosis, prediction of pregnancy outcome, medication changes, prescription, obstetric decision-making, or emergency management is not expected. Any serious symptom, abnormal finding, or patient concern must be discussed with the supervising clinician.

3. Most Relevant Domains of Competence

The most relevant domains of competence for this EPA are:

Communicator
Health Advocate
Professional
Medical Expert / Clinical Reasoner
Collaborator

4. Required Knowledge, Skills, Attitude, and Behaviour

A. Knowledge

The student should be able to demonstrate knowledge of:

1. Basic cardiovascular changes during pregnancy and how they may increase breathlessness, palpitations, fatigue, and cardiac workload.
2. Importance of evaluating progressive exertional dyspnea, systolic murmur, ECG strain pattern, mild cardiac enlargement, anemia, and delayed femoral pulse.
3. Potential maternal and fetal implications of untreated cardiovascular disease during pregnancy.
4. Role of cardiology and obstetric follow-up in protecting maternal health and fetal well-being.

5. Importance of blood pressure monitoring, anemia correction, investigation review, and safe activity planning during pregnancy.
6. Warning symptoms requiring urgent medical attention, including worsening dyspnea, chest pain, syncope, cyanosis, severe palpitations, marked edema, severe headache, or reduced fetal movements.

B. Skills

The student should be able to:

1. Explain the patient's symptoms and abnormal findings in simple, clear, and non-technical language.
2. Communicate that further evaluation is needed without creating unnecessary fear.
3. Counsel the patient and family regarding the importance of cardiology review, obstetric follow-up, echocardiography, blood pressure monitoring, and anemia management.
4. Respond empathetically to the patient's concern about her heart and baby.
5. Encourage the patient to report worsening symptoms and avoid ignoring progressive breathlessness or chest discomfort.
6. Check patient understanding by asking her to repeat key advice in her own words.
7. Present patient concerns and counseling outcomes to the supervisor for review and further guidance.

C. Attitude and Behaviour

The student should be able to demonstrate:

1. Empathy, patience, and sensitivity toward a pregnant patient worried about her health and her baby.
2. Respectful and culturally appropriate communication with the patient and family.
3. Balanced reassurance without dismissing symptoms or giving false assurance.
4. Non-judgmental attitude while discussing follow-up, investigations, lifestyle, anemia, or pregnancy-related concerns.
5. Professional behaviour by avoiding independent treatment advice beyond the learner's role.
6. Respect for patient autonomy, privacy, dignity, and confidentiality.
7. Willingness to seek supervision when the patient asks about diagnosis, treatment, pregnancy risk, or emergency symptoms.

5. Assessment Information Sources

Progress and entrustment decision may be assessed through direct observation of counseling in a simulated or real clinical encounter.

The student may be assessed through OSCE station, Mini-CEX, role play, counseling checklist, case-based discussion, reflective assessment, and supervisor feedback.

The assessment should focus on whether the student can communicate risk empathetically, explain the need for further evaluation and follow-up, respond to patient anxiety, use simple language, check understanding, maintain professionalism, and identify warning symptoms requiring escalation.

6. Entrustment Level and Supervision

The expected level of entrustment is **Level 2–3**.

At **Level 2**, the student may communicate risk and follow-up advice under direct supervision, with the supervisor present or immediately available to guide and correct the communication.

At **Level 3**, the student may provide basic counseling with indirect supervision, provided that the supervisor remains available and reviews the key messages delivered to the patient.

The student is not expected to independently diagnose, prescribe, change medication, predict pregnancy outcome, or make final obstetric or cardiovascular management decisions.

7. Expiration Date

The entrustment decision should be reviewed after one academic year or before progression to a higher level of clinical responsibility.

THEME 4: A Patient with Shock, Acute Chest Pain & Circulatory Collapse

EPA-1: Obtain Focused Emergency History and Identify Red Flags in a Patient with Acute Chest Pain and Circulatory Collapse

Level of Entrustment: Level 2

Activity: Emergency focused history taking and red-flag identification

1. Title of the EPA

Obtain focused emergency history and identify red flags in a patient presenting with acute chest pain and circulatory collapse.

2. Specification and Limitations

This EPA focuses on obtaining a rapid, focused, and clinically relevant emergency history from a 56-year-old male presenting with severe crushing central chest pain, radiation to the left arm and jaw, sweating, nausea, breathlessness, weakness, drowsiness, hypotension, and signs of shock.

The encounter includes rapid introduction, confirmation of patient identity where possible, involvement of family for collateral history, and simultaneous recognition of potentially life-threatening features.

Focused history should include onset, duration, site, character, radiation, severity, aggravating and relieving factors of chest pain, associated symptoms such as sweating, nausea, shortness of breath, weakness, syncope, drowsiness, and feeling of impending doom.

Relevant risk factors should be explored, including hypertension, diabetes mellitus, smoking, obesity, sedentary lifestyle, irregular medication use, previous cardiac symptoms, family history of ischemic heart disease, and drug history.

This EPA is limited to focused emergency history and identification of red flags only. Independent diagnosis, prescription, discharge decision, or emergency management is not expected. Any red-flag finding must be reported immediately to the supervising clinician.

3. Most Relevant Domains of Competence

Medical Expert / Clinical Reasoner
Communicator
Professional
Collaborator
Health Advocate

4. Required Knowledge, Skills, Attitude, and Behaviour

A. Knowledge

The student should be able to demonstrate knowledge of:

1. Classical features of acute coronary syndrome, including crushing central chest pain, radiation to left arm or jaw, sweating, nausea, dyspnea, and sense of impending doom.
2. Cardiovascular risk factors such as hypertension, diabetes mellitus, smoking, obesity, sedentary lifestyle, and poor medication adherence.
3. Red flags in acute chest pain, including hypotension, altered consciousness, weak thready pulse, cold clammy skin, hypoxia, reduced urine output, raised JVP, basal crepitations, and prolonged capillary refill time.
4. Basic pathophysiology of myocardial ischemia, reduced cardiac output, tissue hypoperfusion, and cardiogenic shock.
5. Importance of obtaining collateral history from family in an acutely ill or drowsy patient.
6. Need for urgent escalation when acute chest pain is associated with circulatory collapse.

B. Skills

The student should be able to:

1. Obtain rapid focused history while recognizing that the patient is critically ill.
2. Ask about onset, duration, character, radiation, severity, triggers, and associated symptoms of chest pain.
3. Explore relevant cardiovascular risk factors, medication adherence, previous cardiac history, smoking, diabetes, hypertension, and family history.
4. Obtain collateral history from attendants regarding drowsiness, collapse, pallor, cold extremities, and reduced urine output.
5. Identify red-flag symptoms and signs suggesting acute myocardial infarction and shock.
6. Summarize key history points clearly and immediately inform the supervising clinician.

C. Attitude and Behaviour

The student should be able to demonstrate:

1. Calm, focused, and patient-safe behaviour in an emergency situation.
2. Empathy toward a frightened patient asking whether he is having a heart attack.
3. Respectful communication with the patient and family without creating panic.
4. Awareness of the urgency of the situation without delaying emergency care.
5. Recognition of personal limitations and prompt escalation to the supervisor.
6. Maintenance of patient dignity, privacy, and confidentiality during emergency assessment.

5. Assessment Information Sources

Assessment may include direct observation in emergency simulation or clinical setting, Mini-CEX, OSCE station, case-based discussion, emergency history checklist, supervisor feedback, and reflective assessment.

The assessment should focus on rapid focused history taking, identification of red flags, use of collateral history, communication under pressure, and timely escalation.

6. Entrustment Level and Supervision

The expected level of entrustment is **Level 2**.

At this level, the student may obtain emergency focused history and identify red flags under direct supervision. The supervisor should be physically present or immediately available.

The student is not expected to independently diagnose, manage, prescribe, or make discharge decisions.

7. Expiration Date

The entrustment decision should be reviewed after one academic year or before progression to a higher level of clinical responsibility.

[EPA-2: Perform Initial Assessment of Circulation, Pulse, Blood Pressure, Respiratory Status, Consciousness Level, and Signs of Shock](#)

Level of Entrustment: Level 2

Activity: Initial emergency assessment

1. Title of the EPA

Perform initial assessment of circulation, pulse, blood pressure, respiratory status, consciousness level, and signs of shock in a patient with acute chest pain.

2. Specification and Limitations

This EPA focuses on performing an initial emergency assessment of a 56-year-old male presenting with acute severe chest pain, hypotension, tachycardia, hypoxia, drowsiness, cold clammy extremities, prolonged capillary refill time, reduced urine output, mildly raised JVP, soft heart sounds, possible S3, and basal crepitations.

The assessment includes rapid evaluation of general appearance, level of consciousness, airway and breathing status, respiratory rate, oxygen saturation, pulse rate, pulse volume, blood pressure, capillary refill time, peripheral perfusion, JVP, heart sounds, lung bases, peripheral pulses, and signs of shock.

The learner should recognize features of circulatory compromise, including weak thready pulse, low blood pressure, cold sweaty extremities, altered consciousness, prolonged capillary refill, reduced urine output, and metabolic evidence of poor perfusion if available.

This EPA is limited to initial assessment and recognition of shock. Independent emergency treatment, thrombolysis decision, advanced cardiac life support, prescription, or definitive management is not expected. Any abnormal or life-threatening finding must be reported immediately to the supervising clinician.

3. Most Relevant Domains of Competence

Medical Expert / Clinical Reasoner
Communicator
Professional
Collaborator
Health Advocate

4. Required Knowledge, Skills, Attitude, and Behaviour

A. Knowledge

The student should be able to demonstrate knowledge of:

1. Normal and abnormal vital signs, including pulse, blood pressure, respiratory rate, oxygen saturation, capillary refill time, and consciousness level.
2. Clinical features of shock, including hypotension, tachycardia, weak pulse, cold clammy skin, altered consciousness, reduced urine output, and poor peripheral perfusion.
3. Basic pathophysiology of cardiogenic shock due to reduced left ventricular contractility and reduced cardiac output.
4. Significance of raised JVP, soft heart sounds, S3, basal crepitations, and pulmonary congestion in acute cardiac failure.
5. Relationship between myocardial infarction, pump failure, hypoxia, tissue hypoperfusion, lactic acidosis, and organ dysfunction.
6. Red flags requiring immediate escalation, including severe hypotension, hypoxia, drowsiness, cyanosis, weak pulses, prolonged capillary refill, and worsening breathlessness.

B. Skills

The student should be able to:

1. Perform rapid initial assessment of general condition, consciousness level, respiratory status, circulation, and peripheral perfusion.
2. Measure and interpret pulse, blood pressure, respiratory rate, oxygen saturation, and capillary refill time.
3. Assess pulse volume, rhythm, peripheral pulses, cold extremities, sweating, and signs of poor perfusion.
4. Assess JVP, heart sounds, possible S3, and basal lung crepitations at a basic level.
5. Recognize clinical features suggestive of shock and cardiopulmonary compromise.
6. Present findings clearly and urgently to the supervising clinician.

C. Attitude and Behaviour

The student should be able to demonstrate:

1. Calm and systematic conduct during emergency assessment.
2. Patient safety awareness and avoidance of unnecessary delay.
3. Respectful handling of a frightened, drowsy, and critically ill patient.
4. Clear communication with family while maintaining clinical focus.
5. Recognition of personal limitations and immediate call for senior help.
6. Professionalism, dignity, and confidentiality during emergency care.

5. Assessment Information Sources

Assessment may include direct observation, emergency OSCE station, simulation-based assessment, Mini-CEX, checklist-based assessment of shock recognition, case-based discussion, and supervisor feedback.

The assessment should focus on accurate initial assessment, recognition of shock, prioritization of urgent findings, safe communication, and timely escalation.

6. Entrustment Level and Supervision

The expected level of entrustment is **Level 2**.

At this level, the student may perform initial assessment of circulation, respiratory status, consciousness level, and shock signs under direct supervision.

The student must not independently initiate definitive emergency management or make treatment decisions.

7. Expiration Date

The entrustment decision should be reviewed after one academic year or before progression to a higher level of clinical responsibility.

EPA-3: Interpret ECG, Cardiac Biomarkers, Chest X-ray, and Echocardiography Using Integrated Basic Science and Clinical Knowledge

Level of Entrustment: Level 2

Activity: Interpretation of emergency investigations

1. Title of the EPA

Interpret ECG, cardiac biomarkers, chest X-ray, and echocardiography in a patient with acute chest pain and suspected cardiogenic shock.

2. Specification and Limitations

This EPA focuses on basic interpretation of emergency investigations in a 56-year-old male presenting with acute severe chest pain, hypotension, hypoxia, raised cardiac biomarkers, ST-segment elevation, pulmonary congestion, reduced left ventricular contractility, and features suggestive of cardiogenic shock.

The task includes correlation of ECG, troponin-I, CK-MB, chest X-ray, arterial blood gases, basic laboratory findings, and echocardiography with the clinical presentation.

ECG interpretation should include recognition of ST-segment elevation in anterior chest leads, sinus tachycardia, and possible evolving acute myocardial infarction.

Cardiac biomarker interpretation should include recognition that raised troponin-I and CK-MB support myocardial injury in the appropriate clinical context.

Chest X-ray interpretation should include mild pulmonary congestion, absence of pneumothorax, and mildly enlarged cardiac silhouette.

Echocardiography interpretation should include reduced left ventricular contractility, regional wall motion abnormality, reduced ejection fraction, and features suggestive of cardiogenic shock.

Basic laboratory interpretation should include raised random blood glucose, mildly raised serum creatinine, mild potassium abnormality, metabolic acidosis with raised lactate, and mild leukocytosis as indicators of metabolic stress, hypoperfusion, renal involvement, or acute illness.

This EPA is limited to basic interpretation and early clinical reasoning only. Independent final diagnosis, prescription, reperfusion decision, thrombolysis decision, discharge decision, or emergency management is not expected. Any critical abnormality must be reported immediately to the supervising clinician.

3. Most Relevant Domains of Competence

Medical Expert / Clinical Reasoner
Communicator
Professional
Collaborator

4. Required Knowledge, Skills, Attitude, and Behaviour

A. Knowledge

The student should be able to demonstrate knowledge of:

1. Basic ECG findings in acute myocardial infarction, including ST-segment elevation, sinus tachycardia, rhythm changes, and lead localization.
2. Significance of raised troponin-I and CK-MB in myocardial injury.
3. Chest X-ray features relevant to acute cardiac disease, including pulmonary congestion, cardiomegaly, and exclusion of pneumothorax.
4. Echocardiographic findings of reduced left ventricular contractility, regional wall motion abnormality, reduced ejection fraction, and cardiogenic shock.
5. Basic metabolic consequences of shock, including raised lactate, metabolic acidosis, renal dysfunction, and electrolyte imbalance.
6. Integrated link between coronary artery occlusion, myocardial ischemia, pump failure, pulmonary congestion, hypoxia, and tissue hypoperfusion.
7. Red flags in investigations requiring urgent escalation, including ST elevation, raised biomarkers, reduced ejection fraction, pulmonary congestion, metabolic acidosis, raised lactate, and worsening renal function.

B. Skills

The student should be able to:

1. Identify ST-segment elevation, sinus tachycardia, and possible evolving myocardial infarction on ECG at a basic level.
2. Interpret raised troponin-I and CK-MB in relation to acute chest pain and myocardial injury.
3. Interpret chest X-ray for pulmonary congestion, cardiac silhouette, and absence of pneumothorax.
4. Interpret echocardiography findings of reduced contractility, regional wall motion abnormality, reduced ejection fraction, and cardiogenic shock.
5. Relate raised glucose, creatinine, potassium abnormality, metabolic acidosis, raised lactate, and leukocytosis to acute illness and shock.
6. Integrate clinical and investigation findings to recognize acute myocardial infarction complicated by circulatory compromise.
7. Present critical investigation findings clearly and urgently to the supervising clinician.

C. Attitude and Behaviour

The student should be able to demonstrate:

1. A cautious and patient-safe approach when interpreting life-threatening investigation findings.
2. Avoidance of delay in reporting critical ECG, biomarker, ABG, or echocardiographic abnormalities.
3. Recognition of personal limitations in emergency interpretation and decision-making.
4. Professionalism while discussing serious findings with the healthcare team.
5. Calm and responsible communication without creating panic.

6. Respect for confidentiality and patient dignity during discussion of results.
7. Willingness to seek immediate supervision when findings suggest acute myocardial infarction or shock.

5. Assessment Information Sources

Assessment may include ECG interpretation exercise, cardiac biomarker interpretation, chest X-ray and echocardiography discussion, OSCE station, case-based discussion, viva voce, Mini-CEX, emergency simulation, checklist-based assessment, and supervisor feedback.

The assessment should focus on whether the student can identify critical investigation findings, integrate them with clinical presentation, recognize cardiogenic shock, communicate urgent concerns, and escalate appropriately.

6. Entrustment Level and Supervision

The expected level of entrustment is **Level 2**.

At this level, the student may interpret emergency investigations under direct supervision. The supervisor should be physically present or immediately available to guide interpretation and ensure patient safety.

The student may discuss likely clinical reasoning but should not independently make final diagnosis or management decisions.

7. Expiration Date

The entrustment decision should be reviewed after one academic year or before progression to a higher level of clinical responsibility.

[EPA-4: Communicate Urgency, Risk, and Need for Emergency Management Empathetically to the Patient and Family](#)

Level of Entrustment: Level 2–3

Activity: Emergency communication and family counseling

1. Title of the EPA

Communicate urgency, risk, and need for emergency management empathetically to a patient and family in suspected acute myocardial infarction with shock.

2. Specification and Limitations

This EPA focuses on communicating with a critically ill patient and his family in a clear, empathetic, and non-alarming manner regarding severe acute chest pain, suspected heart attack, circulatory collapse, and need for urgent emergency management.

The task includes acknowledging the patient's fear when he asks, "Doctor, am I having a heart attack? Why do I feel like I am collapsing?" The learner should explain in simple language that the symptoms and initial findings are serious and suggest that the heart may not be pumping effectively, requiring immediate senior medical care and urgent treatment.

Communication should include explanation of urgency, need for continuous monitoring, oxygen/supportive care, ECG and blood tests, cardiac evaluation, and possible emergency interventions as decided by the treating team.

The family should be informed that risk factors such as diabetes, hypertension, smoking, overweight status, sedentary lifestyle, and irregular medication use increase the risk of heart attack and complications.

The learner should also explain that hypotension, drowsiness, cold sweating, low oxygen saturation, raised cardiac biomarkers, ST elevation, and reduced heart pumping function are concerning findings requiring urgent management.

This EPA is limited to basic emergency communication under supervision. Independent diagnosis confirmation, consent for procedures, prognosis prediction, prescription, treatment decision, or detailed discussion of invasive interventions is not expected. Serious questions and decisions must be referred to the supervising clinician.

3. Most Relevant Domains of Competence

Communicator
Professional
Health Advocate
Collaborator
Medical Expert / Clinical Reasoner

4. Required Knowledge, Skills, Attitude, and Behaviour

A. Knowledge

The student should be able to demonstrate knowledge of:

1. Basic meaning of acute myocardial infarction and why severe chest pain with shock signs is a medical emergency.
2. Importance of urgent assessment, ECG, cardiac biomarkers, monitoring, oxygen/supportive care, and senior medical management.
3. Risk factors for heart attack, including hypertension, diabetes mellitus, smoking, obesity, sedentary lifestyle, and irregular medication use.
4. Warning signs of circulatory collapse, including low blood pressure, drowsiness, cold clammy skin, weak pulse, low oxygen saturation, and reduced urine output.
5. Need for timely escalation, multidisciplinary teamwork, and supervised emergency communication.
6. Importance of clear, honest, and compassionate communication during critical illness.

B. Skills

The student should be able to:

1. Communicate the seriousness and urgency of the condition in simple, understandable language.
2. Respond empathetically to fear, anxiety, and questions from the patient and family.
3. Explain the need for emergency monitoring, investigations, and urgent management by the treating team.
4. Avoid giving false reassurance or making unsupported promises about outcome.
5. Check family understanding and encourage them to share relevant history quickly.
6. Refer questions about procedures, prognosis, and treatment decisions to the supervising clinician.
7. Communicate patient and family concerns clearly to the healthcare team.

C. Attitude and Behaviour

The student should be able to demonstrate:

1. Empathy, patience, and calmness while communicating in an emergency.
2. Respectful and culturally appropriate interaction with the patient and family.
3. Honesty without causing unnecessary fear or panic.
4. Professional behaviour by staying within the learner's role and avoiding independent management advice.
5. Respect for patient dignity, privacy, autonomy, and confidentiality.
6. Willingness to seek senior help for difficult questions or serious concerns.
7. Supportive behaviour toward the family while prioritizing patient safety.

5. Assessment Information Sources

Assessment may include direct observation of emergency communication, OSCE station, simulation-based role play, Mini-CEX, counseling checklist, case-based discussion, reflective assessment, and supervisor feedback.

The assessment should focus on empathetic communication, explanation of urgency, avoidance of false reassurance, professional boundaries, recognition of family concerns, and timely escalation to the supervisor.

6. Entrustment Level and Supervision

The expected level of entrustment is **Level 2–3**.

At **Level 2**, the student may communicate urgency and risk under direct supervision, with the supervisor present or immediately available.

At **Level 3**, the student may provide basic supervised counseling with indirect supervision, provided that key messages are reviewed by the supervisor.

The student is not expected to independently confirm diagnosis, obtain procedural consent, prescribe treatment, predict outcome, or make emergency management decisions.

7. Expiration Date

The entrustment decision should be reviewed after one academic year or before progression to a higher level of clinical responsibility.