

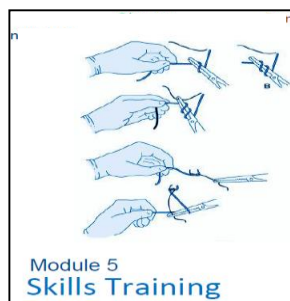
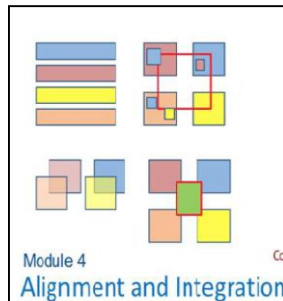
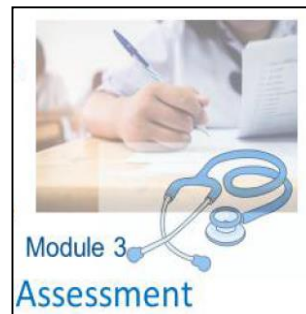
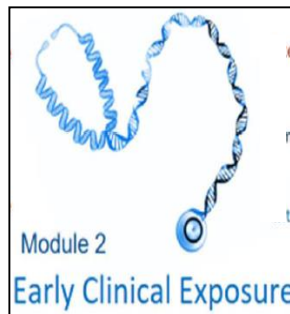
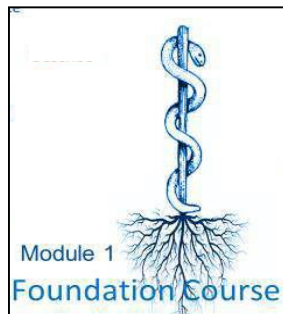
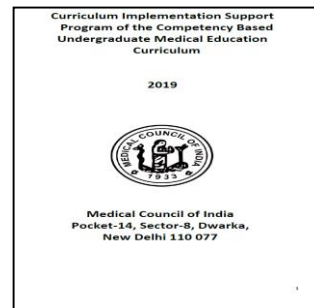
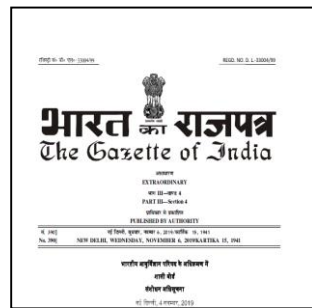


MGMIHS

MGM MEDICAL COLLEGE, NAVI MUMBAI

MCI - MBBS - CBME - CISP - 2019

MGM COMPENDIUM





Mahatma Gandhi Mission's
MEDICAL COLLEGE, NAVI MUMBAI

Date: 03/02/2020

To,
Prof. & HOD, & Faculty Members,
MGM MC, NM.

Subject: MCI – MBBS – CBME – CISP – 2019 – MGM Compendium.

Dear Sir/ Madam,

Medical Council of India has implemented New CBME (competency based undergraduate curriculum) for MBBS Programme.

The GMER (Graduate Medical Education Regulation – 2019), CBME curriculum vol. I, II, III & CISP Modules are available on MCI website (www.mciindia.org), which can be downloaded & used for implementation.

Please find alongwith – MCI – MBBS – CBME – CISP – 2019 – MGM Compendium containing GMER – 2019, CISP, Modules 1, 2, 3, 4, 5 & logbook guidelines.

HODs are requested to discuss the contents in departmental meetings. All faculty members should go through GMER, CBME Curriculum – vol. I, II, III & various modules for CBME implementation.

Dr. R.S. Inamdar
Chairman,
CBME Core Committee, MGMIHS.

Dr. G.S. Narshetty
Dean,
MGM Medical College, Navi Mumbai.

MGMIHS

MGM MEDICAL COLLEGE, NAVI MUMBAI

MCI – MBBS – CBME – CISP Committees

Sr. No.	Name	Designation	CBME Faculty
1.	Dr. G. S. Narshetty	Dean, MGM, MC, NM.	Chairman – Curriculum Committee
2.	Dr. R. S. Inamdar	Professor & HOD, Physiology (Preclinical)	Chairman – CBME Core Committee, MGMIHS & Curriculum Committee Member
3.	Dr. Mrunal Pimparkar	Professor, Community Medicine	MEU Coordinator & Curriculum Committee Member
4.	Dr. Jaishree Ghanekar	Professor & HOD, General Medicine (Medicine & allied disciplines)	Curriculum Committee Member
5.	Dr. Ipseeta Ray	Professor, Pharmacology (Paraclinical)	Curriculum Committee Member & Convenor – AETCOM & Humanities Committee
6.	Dr. Anjali Sabnis	Professor & HOD, Anatomy	Convenor – Phase-I curriculum subcommittee
7.	Dr. Parineeta Samant	Professor & HOD, Biochemistry	Convenor – Foundation Course Committee
8.	Dr. Shilpi Sahu	Professor & HOD, Pathology	Convenor – Phase-II curriculum subcommittee
9.	Dr. N. Abidi	Professor & HOD, Ophthalmology	Convenor – Phase-III curriculum subcommittee
10.	Dr. Vijay Kamale	Professor & HOD, Paediatrics	Convenor – Phase-IV curriculum subcommittee
11.	Dr. Sameer Kadam	Professor, General Surgery/ CVTS	Convenor – Skill Training Committee
12.	Dr. Anahita Hodiwala	Professor, Microbiology	Convenor – Alignment & Integration Committee
13.	Dr. Pradeep Sawardekar	Professor, Community Medicine,	Convenor – Sports & Extracurricular Committee
14.	Dr. Rita Khadkikar	Associate Professor, Physiology	Convenor – Early Clinical Exposure Committee

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MGM MEDICAL COLLEGE, NAVI MUMBAI

MCI – MBBS – CBME – CISP – 2019

MGM COMPENDIUM

INDEX

Sr. No.	Unit	Page No.
1.	G. M. E. R. – 2019	1 – 41
2.	CISP	1 – 102
3.	Module 1 : Foundation Course	1 – 64
4.	Module 2 : Early clinical Exposure	1 – 44
5.	Module 3 : Assessment	1 – 37
6.	Module 4 : Alignment & Integration	1 – 34
7.	Module 5 : Skills Training	1 – 56
8.	Logbook Guidelines	1 – 32
Total No. of Pages =		410



G. M. E. R. – 2019

**BOARD OF GOVERNORS IN SUPER-SESSION
OF MEDICAL COUNCIL OF INDIA**

AMENDMENT NOTIFICATION

New Delhi, the 4th November, 2019

No. MCI-34(41)/2019-Med./161726.—In exercise of the powers conferred by Section 33 of the Indian Medical Council Act, 1956 (102 of 1956), the Board of Governors in super-session of Medical Council of India with the previous sanction of the Central Government, hereby makes the following Regulations to further amend the “Regulations on Graduate Medical Education, 1997”, namely: -

1. (i) These Regulations may be called the “Regulations on Graduate Medical Education (Amendment), 2019.
- (ii) They shall come into force from the date of their publication in the Official Gazette.
2. The following shall be added as clause 1A to the Regulations on Graduate Medical Education, 1997:-
 - (i) The Regulations of Graduate Medical Education, 1997 from clause 2 to 14 contained in Chapters I to V and the Appendices and Schedules appended therein shall be included as Part I of the Regulation. These provisions shall be the governing Regulations with respect to batches admitted in MBBS courses until academic year 2018-19.
 - (ii) Part II containing the following Chapters shall be added to the Regulations on Graduate Medical Education, 1997 that shall be the governing Regulations with respect to batches admitted in MBBS course from academic year 2019-20 onwards.
3. Following shall be added as Part II of the Regulations on Graduate Medical Education, 1997:-

Part II

For MBBS course starting from academic year 2019-20 onwards

THE REGULATIONS ON GRADUATE MEDICAL EDUCATION, 1997

PART II

ARRANGEMENT OF CLAUSES

CHAPTER I

GENERAL CONSIDERATIONS AND TEACHING APPROACH

1. **Introduction**
2. **Objectives of the Indian Medical Graduate Training Programme**
 - 2.1. **National Goals**
 - 2.2. **Institutional Goals**
 - 2.3. **Goals and Roles for the Learner**
3. **Competency Based Training Programme of the Indian Medical Graduate**
4. **Broad Outline on training format**

CHAPTER II**ADMISSION TO INDIAN MEDICAL GRADUATE PROGRAMME:
NATIONAL ELIGIBILITY-CUM-ENTRANCE TEST
AND COMMON COUNSELLING**

5. Admission to the Indian Medical Graduate Programme

CHAPTER III**MIGRATION**

6. Migration

CHAPTER IV**PHASE WISE TRAINING AND TIME DISTRIBUTION
FOR PROFESSIONAL DEVELOPMENT**

7. Training period and time distribution:
8. Phase distribution and timing of examination
9. New teaching / learning elements
- 9.1. Foundation Course
 - 9.2. Early Clinical Exposure
 - 9.3. Electives
 - 9.4. Professional Development including Attitude, Ethics
and Communication Module (AETCOM)
 - 9.5. Learner-doctor method of clinical training (Clinical Clerkship)

CHAPTER V**COMPETENCY BASED CURRICULUM OF THE
INDIAN MEDICAL GRADUATE PROGRAMME**

10. Specific Competencies
- 10.1. Preamble
 - 10.2. Integration
 - 10.3. Pre-clinical Subjects
 - 10.4. Second Professional (Para-Clinical)
 - 10.5. Third Professional (Part I)
 - 10.6. Third Professional (Part II)

CHAPTER VI**ASSESSMENT**

11. Assessment
- 11.1 Eligibility to appear for Professional examinations

11.2 University Examinations**CHAPTER VII
INTERNSHIP****12. Internship****12.1 Goal****12.2 Objectives****12.3 Time Distribution****12.4 Other details****12.5 Assessment of Internship****12.6 Internship – discipline related****CHAPTER I****GENERAL CONSIDERATIONS AND TEACHING APPROACH****1. Introduction**

The provisions contained in Part II of these Regulations shall apply to the MBBS course starting from academic year 2019-20 onwards

2. Indian Medical Graduate Training Programme

The undergraduate medical education programme is designed with a goal to create an “Indian Medical Graduate” (IMG) possessing requisite knowledge, skills, attitudes, values and responsiveness, so that she or he may function appropriately and effectively as a physician of first contact of the community while being globally relevant. To achieve this, the following national and institutional goals for the learner of the Indian Medical Graduate training programme are hereby prescribed:-

2.1. National Goals

At the end of undergraduate program, the Indian Medical Graduate should be able to:

- (a) Recognize “health for all” as a national goal and health right of all citizens and by undergoing training for medical profession to fulfill his/her social obligations towards realization of this goal.
- (b) Learn every aspect of National policies on health and devote her/him to its practical implementation.
- (c) Achieve competence in practice of holistic medicine, encompassing promotive, preventive, curative and rehabilitative aspects of common diseases.
- (d) Develop scientific temper, acquire educational experience for proficiency in profession and promote healthy living.
- (e) Become exemplary citizen by observance of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.

2.2. Institutional Goals

- (1) In consonance with the national goals each medical institution should evolve institutional goals to define the kind of trained manpower (or professionals) they intend to produce. The Indian Medical Graduates coming out of a medical institute should:
 - (a) be competent in diagnosis and management of common health problems of the individual and the community, commensurate with his/her position as a member of the health team at the primary, secondary or tertiary levels, using his/her clinical skills based on history, physical examination and relevant investigations.
 - (b) be competent to practice preventive, promotive, curative, palliative and rehabilitative medicine in respect to the commonly encountered health problems.
 - (c) appreciate rationale for different therapeutic modalities; be familiar with the administration of “essential medicines” and their common adverse effects.

- (d) be able to appreciate the socio-psychological, cultural, economic and environmental factors affecting health and develop humane attitude towards the patients in discharging one's professional responsibilities.
 - (e) possess the attitude for continued self learning and to seek further expertise or to pursue research in any chosen area of medicine, action research and documentation skills.
 - (f) be familiar with the basic factors which are essential for the implementation of the National Health Programmes including practical aspects of the following:
 - (i) Family Welfare and Maternal and Child Health (MCH)
 - (ii) Sanitation and water supply
 - (iii) Prevention and control of communicable and non-communicable diseases
 - (iv) Immunization
 - (v) Health Education
 - (vi) Indian Public Health Standards (IPHS), at various levels of service delivery
 - (vii) Bio-medical waste disposal
 - (viii) Organizational and/or institutional arrangements.
 - (g) acquire basic management skills in the area of human resources, materials and resource management related to health care delivery, hospital management, inventory skills and counseling.
 - (h) be able to identify community health problems and learn to work to resolve these by designing, instituting corrective steps and evaluating outcome of such measures.
 - (i) be able to work as a leading partner in health care teams and acquire proficiency in communication skills.
 - (j) be competent to work in a variety of health care settings.
 - (k) have personal characteristics and attitudes required for professional life such as personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.
- (2) All efforts must be made to equip the medical graduate to acquire the skills as detailed in Table 11 Certifiable procedural skills – A Comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) – Indian Medical Graduate.

2.3. Goals and Roles for the Learner

In order to fulfil the goal of the IMG training programme, the medical graduate must be able to function in the following roles appropriately and effectively:-

- 2.3.1. Clinician who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.
- 2.3.2. Leader and member of the health care team and system with capabilities to collect analyze, synthesize and communicate health data appropriately.
- 2.3.3. Communicator with patients, families, colleagues and community.
- 2.3.4. Lifelong learner committed to continuous improvement of skills and knowledge.
- 2.3.5. Professional, who is committed to excellence, is ethical, responsive and accountable to patients, community and profession.

3. Competency Based Training Programme of the Indian Medical Graduate

Competency based learning would include designing and implementing medical education curriculum that focuses on the desired and observable ability in real life situations. In order to effectively fulfil the roles as listed in clause 2, the Indian Medical Graduate would have obtained the following set of competencies at the time of graduation:

3.1. *Clinician, who understands and provides preventive, promotive, curative, palliative and holistic care with compassion*

- 3.1.1 Demonstrate knowledge of normal human structure, function and development from a molecular, cellular, biologic, clinical, behavioural and social perspective.

- 3.1.2. Demonstrate knowledge of abnormal human structure, function and development from a molecular, cellular, biological, clinical, behavioural and social perspective.
- 3.1.3. Demonstrate knowledge of medico-legal, societal, ethical and humanitarian principles that influence health care.
- 3.1.4. Demonstrate knowledge of national and regional health care policies including the National Health Mission that incorporates National Rural Health Mission (NRHM) and National Urban Health Mission (NUHM), frameworks, economics and systems that influence health promotion, health care delivery, disease prevention, effectiveness, responsiveness, quality and patient safety.
- 3.1.5. Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is complete and relevant to disease identification, disease prevention and health promotion.
- 3.1.6. Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is contextual to gender, age, vulnerability, social and economic status, patient preferences, beliefs and values.
- 3.1.7. Demonstrate ability to perform a physical examination that is complete and relevant to disease identification, disease prevention and health promotion.
- 3.1.8. Demonstrate ability to perform a physical examination that is contextual to gender, social and economic status, patient preferences and values.
- 3.1.9. Demonstrate effective clinical problem solving, judgment and ability to interpret and integrate available data in order to address patient problems, generate differential diagnoses and develop individualized management plans that include preventive, promotive and therapeutic goals.
- 3.1.10. Maintain accurate, clear and appropriate record of the patient in conformation with legal and administrative frame works.
- 3.1.11. Demonstrate ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context.
- 3.1.12. Demonstrate ability to prescribe and safely administer appropriate therapies including nutritional interventions, pharmacotherapy and interventions based on the principles of rational drug therapy, scientific validity, evidence and cost that conform to established national and regional health programmes and policies for the following:
 - (i) Disease prevention,
 - (ii) Health promotion and cure,
 - (iii) Pain and distress alleviation, and
 - (iv) Rehabilitation.
- 3.1.13. Demonstrate ability to provide a continuum of care at the primary and/or secondary level that addresses chronicity, mental and physical disability.
- 3.1.14. Demonstrate ability to appropriately identify and refer patients who may require specialized or advanced tertiary care.
- 3.1.15. Demonstrate familiarity with basic, clinical and translational research as it applies to the care of the patient.
- 3.2. ***Leader and member of the health care team and system***
 - 3.2.1. Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals.
 - 3.2.2. Recognize and function effectively, responsibly and appropriately as a health care team leader in primary and secondary health care settings.
 - 3.2.3. Educate and motivate other members of the team and work in a collaborative and collegial fashion that will help maximize the health care delivery potential of the team.
 - 3.2.4. Access and utilize components of the health care system and health delivery in a manner that is appropriate, cost effective, fair and in compliance with the national health care priorities and policies, as well as be able to collect, analyze and utilize health data.

- 3.2.5 Participate appropriately and effectively in measures that will advance quality of health care and patient safety within the health care system.
- 3.2.6 Recognize and advocate health promotion, disease prevention and health care quality improvement through prevention and early recognition: in a) life style diseases and b) cancers, in collaboration with other members of the health care team.
- 3.3. ***Communicator with patients, families, colleagues and community***
- 3.3.1 Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.
- 3.3.2 Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and trustworthy.
- 3.3.3 Demonstrate ability to communicate with patients in a manner respectful of patient's preferences, values, prior experience, beliefs, confidentiality and privacy.
- 3.3.4 Demonstrate ability to communicate with patients, colleagues and families in a manner that encourages participation and shared decision-making.
- 3.4. ***Lifelong learner committed to continuous improvement of skills and knowledge***
- 3.4.1. Demonstrate ability to perform an objective self-assessment of knowledge and skills, continue learning, refine existing skills and acquire new skills.
- 3.4.2. Demonstrate ability to apply newly gained knowledge or skills to the care of the patient.
- 3.4.3. Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.
- 3.4.4. Demonstrate ability to search (including through electronic means), and critically evaluate the medical literature and apply the information in the care of the patient.
- 3.4.5. Be able to identify and select an appropriate career pathway that is professionally rewarding and personally fulfilling.
- 3.5. ***Professional who is committed to excellence, is ethical, responsive and accountable to patients, community and the profession***
- 3.5.1. Practice selflessness, integrity, responsibility, accountability and respect.
- 3.5.2. Respect and maintain professional boundaries between patients, colleagues and society.
- 3.5.3. Demonstrate ability to recognize and manage ethical and professional conflicts.
- 3.5.4. Abide by prescribed ethical and legal codes of conduct and practice.
- 3.5.5. Demonstrate a commitment to the growth of the medical profession as a whole.

4. Broad Outline on training format

- 4.1. In order to ensure that training is in alignment with the goals and competencies listed in sub-clause 2 and 3 above:
 - 4.1.1 There shall be a "Foundation Course" to orient medical learners to MBBS programme, and provide them with requisite knowledge, communication (including electronic), technical and language skills.
 - 4.1.2 The curricular contents shall be vertically and horizontally aligned and integrated to the maximum extent possible in order to enhance learner's interest and eliminate redundancy and overlap.
 - 4.1.3. Teaching-learning methods shall be learner centric and shall predominantly include small group learning, interactive teaching methods and case based learning.
 - 4.1.4. Clinical training shall emphasize early clinical exposure, skill acquisition, certification in essential skills; community/primary/secondary care-based learning experiences and emergencies.
 - 4.1.5. Training shall primarily focus on preventive and community based approaches to health and disease, with specific emphasis on national health priorities such as family welfare, communicable and non-communicable diseases including cancer, epidemics and disaster management.

- 4.1.6. Acquisition and certification of skills shall be through experiences in patient care, diagnostic and skill laboratories.
- 4.1.7. The development of ethical values and overall professional growth as integral part of curriculum shall be emphasized through a structured longitudinal and dedicated programme on professional development including attitude, ethics and communication.
- 4.1.8. Progress of the medical learner shall be documented through structured periodic assessment that includes formative and summative assessments. Logs of skill-based training shall be also maintained.
- 4.2. Appropriate Faculty Development Programmes shall be conducted regularly by institutions to facilitate medical teachers at all levels to continuously update their professional and teaching skills, and align their teaching skills to curricular objectives.

CHAPTER II

ADMISSION TO INDIAN MEDICAL GRADUATE PROGRAMME: NATIONAL ELIGIBILITY-CUM-ENTRANCE TEST AND COMMON COUNSELLING

5. Admission to the Indian Medical Graduate Programme

The provision as contained in Part I – Chapter II shall be the governing provisions.

CHAPTER III

MIGRATION

6. Migration

The provision as contained in Part I - Chapter II Clause 6 shall be the governing provisions.

CHAPTER IV

PHASE WISE TRAINING AND TIME DISTRIBUTION FOR PROFESSIONAL DEVELOPMENT

The Competency based Undergraduate Curriculum and Attitude, Ethics and Communication (AETCOM) course, as published by the Medical Council of India and also made available on the Council's website, shall be the curriculum for the batches admitted in MBBS from the academic year 2019-20 onwards.

Provided that in respect of batches admitted prior to the academic year 2019-20, the governing provisions shall remain as contained in the Part I of these Regulations.

7. Training period and time distribution:

- 7.1. Every learner shall undergo a period of certified study extending over 4 ½ academic years, divided into nine semesters from the date of commencement of course to the date of completion of examination which shall be followed by one year of compulsory rotating internship.
- 7.2. Each academic year will have at least 240 teaching days with a minimum of eight hours of working on each day including one hour as lunch break.
- 7.3. Teaching and learning shall be aligned and integrated across specialties both vertically and horizontally for better learner comprehension. Learner centered learning methods should include problem oriented learning, case studies, community oriented learning, self- directed and experiential learning.
- 7.4. The period of 4 ½ years is divided as follows:
 - 7.4.1 Pre-Clinical Phase [(Phase I) - First Professional phase of 13 months preceded by Foundation Course of one month]: will consist of preclinical subjects – Human Anatomy, Physiology, Biochemistry, Introduction to Community Medicine, Humanities, Professional development including Attitude, Ethics & Communication (AETCOM) module and early clinical exposure, ensuring both horizontal and vertical integration.
 - 7.4.2 Para-clinical phase [(Phase II) - Second Professional (12 months)]: will consist of Para-clinical subjects namely Pathology, Pharmacology, Microbiology, Community Medicine, Forensic Medicine and Toxicology, Professional development including Attitude, Ethics & Communication (AETCOM) module and introduction to clinical subjects ensuring both horizontal and vertical integration.

The clinical exposure to learners will be in the form of learner-doctor method of clinical training in all phases. The emphasis will be on primary, preventive and comprehensive health care. A part of training during clinical postings should take place at the *primary level* of health care. It is desirable to provide learning experiences in secondary health care, wherever possible. This will involve:

- (a) Experience in recognizing and managing common problems seen in outpatient, inpatient and emergency settings,
- (b) Involvement in patient care as a team member,
- (c) Involvement in patient management and performance of basic procedures.

7.4.3 Clinical Phase – [(Phase III) Third Professional (28 months)]

- (a) Part I (13 months) - The clinical subjects include General Medicine, General Surgery, Obstetrics & Gynaecology, Pediatrics, Orthopaedics, Dermatology, Otorhinolaryngology, Ophthalmology, Community Medicine, Forensic Medicine and Toxicology, Psychiatry, Respiratory Medicine, Radiodiagnosis & Radiotherapy and Anaesthesiology & Professional development including AETCOM module.
- (b) Electives (2 months) - To provide learners with opportunity for diverse learning experiences, to do research/community projects that will stimulate enquiry, self directed experimental learning and lateral thinking [9.3].
- (c) Part II (13 months) - Clinical subjects include:
 - i. Medicine and allied specialties (General Medicine, Psychiatry, Dermatology Venereology and Leprosy (DVL), Respiratory Medicine including Tuberculosis)
 - ii. Surgery and allied specialties (General Surgery, Orthopedics [including trauma]), Dentistry, Physical Medicine and rehabilitation, Anaesthesiology and Radiodiagnosis)
 - iii. Obstetrics and Gynecology (including Family Welfare)
 - iv. Pediatrics
 - v. AETCOM module

7.5 Didactic lectures shall not exceed one third of the schedule; two third of the schedule shall include interactive sessions, practicals, clinical or/and group discussions. The learning process should include clinical experiences, problem oriented approach, case studies and community health care activities.

The admission shall be made strictly in accordance with the statutory notified time schedule towards the same.

7.6 Universities shall organize admission timing and admission process in such a way that teaching in the first Professional year commences with induction through the Foundation Course by the 1st of August of each year.

(i) Supplementary examinations shall not be conducted later than 90 days from the date of declaration of the results of the main examination, so that the learners who pass can join the main batch for progression and the remainder would appear for the examination in the subsequent year.

(ii) A learner shall not be entitled to graduate later than ten (10) years of her/his joining the first MBBS course.

7.7 No more than four attempts shall be allowed for a candidate to pass the first Professional examination. The total period for successful completion of first Professional course shall not exceed four (4) years. Partial attendance of examination in any subject shall be counted as an attempt.

7.8 A learner, who fails in the second Professional examination, shall not be allowed to appear in third Professional Part I examination unless she/he passes all subjects of second Professional examination.

7.9 Passing in third Professional (Part I) examination is not compulsory before starting part II training; however, passing of third Professional (Part I) is compulsory for being eligible for third Professional (Part II) examination.

7.10 During para-clinical and clinical phases, including prescribed 2 months of electives, clinical postings of three hours duration daily as specified in Tables 5, 6, 7 and 8 would apply for various departments.

8. Phase distribution and timing of examination

8.1 Time distribution of the MBBS programme is given in Table 1.

- 8.2 Distribution of subjects by Professional Phase-wise is given in Table 2.
- 8.3 Minimum teaching hours prescribed in various disciplines are as under Tables 3-7.
- 8.4 Distribution of clinical postings is given in Table 8.
- 8.5 Duration of clinical postings will be:
- 8.5.1 Second Professional : 36 weeks of clinical posting (Three hours per day - five days per week : Total 540 hours)
- 8.5.2 Third Professional part I: 42 weeks of clinical posting (Three hours per day - six days per week : Total 756 hours)
- 8.5.3 Third Professional part II: 44 weeks of clinical posting (Three hours per day - six days per week : Total 792 hours)
- 8.6 Time allotted excludes time reserved for internal / University examinations, and vacation.
- 8.7 Second professional clinical postings shall commence before / after declaration of results of the first professional phase examinations, as decided by the institution/ University. Third Professional parts I and part II clinical postings shall start no later than two weeks after the completion of the previous professional examination.
- 8.8 25% of allotted time of third Professional shall be utilized for integrated learning with pre- and para- clinical subjects. This will be included in the assessment of clinical subjects.

Table 1: Time distribution of MBBS Programme & Examination Schedule

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							Foundation Course	I MBBS			
I MBBS								Exam I MBBS	II MBBS		
II MBBS								Exam II MBBS	III MBBS		
III MBBS Part I									Exam III MBBS Part I	Electives & Skills	
III MBBS Part II											
Exam III MBBS Part II	Internship										
Internship											

- One month is provided at the end of every professional year for completion of examination and declaration of results.

Table 2: Distribution of subjects by Professional Phase

Phase & year of MBBS training	Subjects & New Teaching Elements	Duration#	University examination
First Professional MBBS	<ul style="list-style-type: none"> • Foundation Course (1 month) • Human Anatomy, Physiology & Biochemistry, introduction to Community Medicine, Humanities • Early Clinical Exposure 	1 + 13 months	I Professional

	<ul style="list-style-type: none"> Attitude, Ethics, and Communication Module (AETCOM) 		
Second Professional MBBS	<ul style="list-style-type: none"> Pathology, Microbiology, Pharmacology, Forensic Medicine and Toxicology, Introduction to clinical subjects including Community Medicine Clinical postings Attitude, Ethics & Communication Module (AETCOM) 	12 months	II Professional
Third Professional MBBS Part I	<ul style="list-style-type: none"> General Medicine, General Surgery, Obstetrics & Gynecology, Pediatrics, Orthopedics, Dermatology, Psychiatry, Otorhinolaryngology, Ophthalmology, Community Medicine, Forensic Medicine and Toxicology, Respiratory medicine, Radiodiagnosis & Radiotherapy, Anesthesiology Clinical subjects /postings Attitude, Ethics & Communication Module (AETCOM) 	13 months	III Professional (Part I)
Electives	<ul style="list-style-type: none"> Electives, Skills and assessment* 	2 months	
Third Professional MBBS Part II	<ul style="list-style-type: none"> General Medicine, Pediatrics, General Surgery, Orthopedics, Obstetrics and Gynecology including Family welfare and allied specialties Clinical postings/subjects Attitude, Ethics & Communication Module (AETCOM) 	13 months	III Professional (Part II)

*Assessment of electives shall be included in Internal Assessment.

Table 3: Foundation Course (one month)

Subjects/ Contents	Teaching hours	Self Directed Learning (hours)	Total hours
Orientation ¹	30	0	30
Skills Module ²	35	0	35
Field visit to Community Health Center	8	0	8
Introduction to Professional Development & AETCOM module	-	-	40
Sports and extracurricular activities	22	0	22
Enhancement of language/ computer skills ³	40	0	40
	-	-	175

1. Orientation course will be completed as single block in the first week and will contain elements outlined in 9.1.
2. Skills modules will contain elements outlined in 9.1.
3. Based on perceived need of learners, one may choose language enhancement (English or local spoken or both) and computer skills. This should be provided longitudinally through the duration of the Foundation Course.

Teaching of Foundation Course will be organized by pre-clinical departments.

Table 4: First Professional teaching hours

Subjects	Lectures (hours)	Small Group Teaching/ Tutorials/ Integrated learning/ Practical (hours)	Self directed learning (hours)	Total (hours)
Human Anatomy	220	415	40	675
Physiology*	160	310	25	495
Biochemistry	80	150	20	250
Early Clinical Exposure**	90	-	0	90
Community Medicine	20	27	5	52
Attitude, Ethics & Communication Module (AETCOM) ***	-	26	8	34
Sports and extracurricular activities	-	-	-	60
Formative assessment and Term examinations	-	-	-	80
Total	-	-	-	1736

* including Molecular Biology.

** Early clinical exposure hours to be divided equally in all three subjects.

*** AETCOM module shall be a longitudinal programme.

Table 5: Second Professional teaching hours

Subjects	Lectures (hours)	Small group learning (Tutorials / Seminars) /Integrated learning (hours)	Clinical Postings (hours) *	Self - Directed Learning (hours)	Total (hours)
Pathology	80	138	-	12	230
Pharmacology	80	138	-	12	230
Microbiology	70	110	-	10	190
Community Medicine	20	30	-	10	60
Forensic Medicine and Toxicology	15	30	-	5	50
Clinical Subjects	75**	-	540***		615
Attitude, Ethics & Communication Module (AETCOM)		29	-	8	37
Sports and extracurricular activities	-	-	-	28	28
Total	-	-	-	-	1440

* At least 3 hours of clinical instruction each week must be allotted to training in clinical and procedural skill laboratories. Hours may be distributed weekly or as a block in each posting based on institutional logistics.

** 25 hours each for Medicine, Surgery and Gynecology & Obstetrics.

***The clinical postings in the second professional shall be 15 hours per week (3 hrs per day from Monday to Friday).

Table 6: Third Professional Part I teaching hours

Subjects	Teaching Hours	Tutorials/ Seminars /Integrated Teaching (hours)	Self- Directed Learning (hours)	Total (hours)
General Medicine	25	35	5	65
General Surgery	25	35	5	65
Obstetrics and Gynecology	25	35	5	65
Pediatrics	20	30	5	55
Orthopaedics	15	20	5	40
Forensic Medicine and Toxicology	25	45	5	75
Community Medicine	40	60	5	105
Dermatology	20	5	5	30
Psychiatry	25	10	5	40
Respiratory Medicine	10	8	2	20
Otorhinolaryngology	25	40	5	70
Ophthalmology	30	60	10	100
Radiodiagnosis and Radiotherapy	10	8	2	20
Anesthesiology	8	10	2	20
Clinical Postings*	-	-	-	756
Attitude, Ethics & Communication Module (AETCOM)		19	06	25
Total	303	401	66	1551

* The clinical postings in the third professional part I shall be 18 hours per week (3 hrs per day from Monday to Saturday).

Table 7: Third Professional Part II teaching hours

Subjects	Teaching Hours	Tutorials/Seminars / Integrated Teaching (hours)	Self - Directed Learning (hours)	Total* (hours)
General Medicine	70	125	15	210
General Surgery	70	125	15	210
Obstetrics and Gynecology	70	125	15	210
Pediatrics	20	35	10	65
Orthopaedics	20	25	5	50
Clinical Postings**				792
Attitude, Ethics & Communication Module (AETCOM)***	28		16	43
Electives				200
Total	250	435	60	1780

* 25% of allotted time of third professional shall be utilized for integrated learning with pre- and para- clinical subjects and shall be assessed during the clinical subjects examination. This allotted time will be utilized as integrated teaching by para-clinical subjects with clinical subjects (as Clinical Pathology, Clinical Pharmacology and Clinical Microbiology).

** *The clinical postings in the third professional part II shall be 18 hours per week (3 hrs per day from Monday to Saturday).*

*** Hours from clinical postings can also be used for AETCOM modules.

Table 8: Clinical postings

Subjects	Period of training in weeks			Total weeks
	II MBBS	III MBBS Part I	III MBBS Part II	
Electives	-	-	8* (4 regular clinical posting)	4
General Medicine ¹	4	4	8+4	20
General Surgery	4	4	8+4	20
Obstetrics & Gynaecology ²	4	4	8 +4	20
Pediatrics	2	4	4	10
Community Medicine	4	6	-	10
Orthopedics - including Trauma ³	2	4	2	8
Otorhinolaryngology	4	4	-	8
Ophthalmology	4	4	-	8
Respiratory Medicine	2	-	-	2
Psychiatry	2	2	-	4
Radiodiagnosis ⁴	2	-	-	2
Dermatology, Venereology & Leprosy	2	2	2	6
Dentistry & Anesthesia	-	2	-	2
Casualty	-	2	-	2
	36	42	48	126

* In four of the eight weeks of electives, regular clinical postings shall be accommodated.

Clinical postings may be adjusted within the time framework.

¹ This posting includes Laboratory Medicine (Para-clinical) & Infectious Diseases (Phase III Part I).

² This includes maternity training and family welfare (including Family Planning).

³ This posting includes Physical Medicine and Rehabilitation.

⁴ This posting includes Radiotherapy, wherever available.

9. New teaching / learning elements

9.1. Foundation Course

9.1.1 **Goal:** The goal of the Foundation Course is to prepare a learner to study medicine effectively. It will be of one month duration after admission.

9.1.2 **Objectives:** The objectives are to:

(a) Orient the learner to:

- (i) The medical profession and the physician's role in society
- (ii) The MBBS programme
- (iii) Alternate health systems in the country and history of medicine

- (iv) Medical ethics, attitudes and professionalism
- (v) Health care system and its delivery
- (vi) National health programmes and policies
- (vii) Universal precautions and vaccinations
- (viii) Patient safety and biohazard safety
- (ix) Principles of primary care (general and community based care)
- (x) The academic ambience

(b) Enable the learner to acquire enhanced skills in:

- (i) Language
- (ii) Interpersonal relationships
- (iii) Communication
- (iv) Learning including self-directed learning
- (v) Time management
- (vi) Stress management
- (vii) Use of information technology

(c) Train the learner to provide:

- (i) First-aid
- (ii) Basic life support

9.1.3 In addition to the above, learners may be enrolled in one of the following programmes which will be run concurrently:

- (a) Local language programme
- (b) English language programme
- (c) Computer skills
- (d) These may be done in the last two hours of the day for the duration of the Foundation Course.

9.1.4 These sessions must be as interactive as possible.

9.1.5 Sports (to be used through the Foundation Course as protected 04 hours / week).

9.1.6 Leisure and extracurricular activity (to be used through the Foundation Course as protected 02 hours per week).

9.1.7 Institutions shall develop learning modules and identify the appropriate resource persons for their delivery.

9.1.8 The time committed for the Foundation Course may not be used for any other curricular activity.

9.1.9 The Foundation Course will have compulsory 75% attendance. This will be certified by the Dean of the college.

9.1.10 The Foundation Course will be organized by the Coordinator appointed by the Dean of the college and will be under supervision of the heads of the preclinical departments.

9.1.11 Every college must arrange for a meeting with parents and their wards.

9.2. Early Clinical Exposure

9.2.1 **Objectives:** The objectives of early clinical exposure of the first-year medical learners are to enable the learner to:

- (a) Recognize the relevance of basic sciences in diagnosis, patient care and treatment,
- (b) Provide a context that will enhance basic science learning,
- (c) Relate to experience of patients as a motivation to learn,
- (d) Recognize attitude, ethics and professionalism as integral to the doctor-patient relationship,

- (e) Understand the socio-cultural context of disease through the study of humanities.

9.2.2 Elements

- (a) Basic science correlation: i.e. apply and correlate principles of basic sciences as they relate to the care of the patient (this will be part of integrated modules).
- (b) Clinical skills: to include basic skills in interviewing patients, doctor-patient communication, ethics and professionalism, critical thinking and analysis and self-learning (this training will be imparted in the time allotted for early clinical exposure).
- (c) Humanities: To introduce learners to a broader understanding of the socio-economic framework and cultural context within which health is delivered through the study of humanities and social sciences.

9.3. Electives

- 9.3.1 **Objectives:** To provide the learner with opportunities:

- (a) For diverse learning experiences,
- (b) To do research/community projects that will stimulate enquiry, self-directed, experiential learning and lateral thinking.

- 9.3.2 Two months are designated for elective rotations after completion of the examination at end of the third MBBS Part I and before commencement of third MBBS Part II.

- 9.3.3 It is mandatory for learners to do an elective. The elective time should not be used to make up for missed clinical postings, shortage of attendance or other purposes.

9.3.4 Structure

- (a) The learner shall rotate through two elective blocks of 04 weeks each.
- (b) Block 1 shall be done in a pre-selected preclinical or para-clinical or other basic sciences laboratory OR under a researcher in an ongoing research project.
- During the electives regular clinical postings shall continue.
- (c) Block 2 shall be done in a clinical department (including specialties, super-specialties, ICUs, blood bank and casualty) from a list of electives developed and available in the institution.

OR

as a supervised learning experience at a rural or urban community clinic.

- (d) Institutions will pre-determine the number and nature of electives, names of the supervisors, and the number of learners in each elective based on the local conditions, available resources and faculty.

- 9.3.5 Each institution will develop its own mechanism for allocation of electives.

- 9.3.6 It is preferable that elective choices are made available to the learners in the beginning of the academic year.

- 9.3.7 The learner must submit a learning log book based on both blocks of the elective.

- 9.3.8 75% attendance in the electives and submission of log book maintained during elective is required for eligibility to appear in the final MBBS examination.

- 9.3.9 Institutions may use part of this time for strengthening basic skill certification.

9.4. Professional Development including Attitude, Ethics and Communication Module (AETCOM)

- 9.4.1 **Objectives** of the programme: At the end of the programme, the learner must demonstrate ability to:

- (a) understand and apply principles of bioethics and law as they apply to medical practice and research understand and apply the principles of clinical reasoning as they apply to the care of the patients,
- (b) understand and apply the principles of system based care as they relate to the care of the patient,
- (c) understand and apply empathy and other human values to the care of the patient,
- (d) communicate effectively with patients, families, colleagues and other health care professionals,

- (e) understand the strengths and limitations of alternative systems of medicine,
- (f) respond to events and issues in a professional, considerate and humane fashion,
- (g) translate learning from the humanities in order to further his / her professional and personal growth.

9.4.2 **Learning experiences:**

- (a) This will be a longitudinal programme spread across the continuum of the MBBS programme including internship,
- (b) Learning experiences may include – small group discussions, patient care scenarios, workshop, seminars, role plays, lectures etc.
- (c) Attitude, Ethics & Communication Module (AETCOM module) developed by Medical Council of India should be used longitudinally for purposes of instruction.

9.4.3 75% attendance in Professional Development Programme (AETCOM Module) is required for eligibility to appear for final examination in each professional year.

9.4.4 Internal Assessment will include:

- (a) Written tests comprising of short notes and creative writing experiences,
- (b) OSCE based clinical scenarios / viva voce.

9.4.5 At least one question in each paper of the clinical specialties in the University examination should test knowledge competencies acquired during the professional development programme.

9.4.6 Skill competencies acquired during the Professional Development Programme must be tested during the clinical, practical and viva voce.

9.5. Learner-doctor method of clinical training (Clinical Clerkship)

9.5.1 **Goal:** To provide learners with experience in:

- (a) Longitudinal patient care,
- (b) Being part of the health care team,
- (c) Hands-on care of patients in outpatient and inpatient setting.

9.5.2 **Structure:**

- (a) The first clinical posting in second professional shall orient learners to the patient, their roles and the specialty.
- (b) The learner-doctor programme will progress as outlined in Table 9.
- (c) The learner will function as a part of the health care team with the following responsibilities:
 - (i) Be part of the unit's outpatient services on admission days,
 - (ii) Remain with the admission unit until 6 PM except during designated class hours,
 - (iii) Be assigned patients admitted during each admission day for whom he/she will undertake responsibility, under the supervision of a senior resident or faculty member,
 - (iv) Participate in the unit rounds on its admission day and will present the assigned patients to the supervising physician,
 - (v) Follow the patient's progress throughout the hospital stay until discharge,
 - (vi) Participate, under supervision, in procedures, surgeries, deliveries etc. of assigned patients (according to responsibilities outlined in table 9),
 - (vii) Participate in unit rounds on at least one other day of the week excluding the admission day,
 - (viii) Discuss ethical and other humanitarian issues during unit rounds,
 - (ix) Attend all scheduled classes and educational activities,
 - (x) Document his/her observations in a prescribed log book / case record.

(d) No learner will be given independent charge of the patient

- (e) The supervising physician will be responsible for all patient care decisions

9.5.3 **Assessment:**

- (a) A designated faculty member in each unit will coordinate and facilitate the activities of the learner, monitor progress, provide feedback and review the log book/ case record.
- (b) The log book/ case record must include the written case record prepared by the learner including relevant investigations, treatment and its rationale, hospital course, family and patient discussions, discharge summary etc.
- (c) The log book should also include records of outpatients assigned. Submission of the log book/ case record to the department is required for eligibility to appear for the final examination of the subject.

Table 9: Learner - Doctor programme (Clinical Clerkship)

Year of Curriculum	Focus of Learner - Doctor programme
Year 1	Introduction to hospital environment, early clinical exposure, understanding perspectives of illness
Year 2	History taking, physical examination, assessment of change in clinical status, communication and patient education
Year 3	All of the above and choice of investigations, basic procedures and continuity of care
Year 4	All of the above and decision making, management and outcomes

CHAPTER V**COMPETENCY BASED CURRICULUM OF THE INDIAN MEDICAL GRADUATE PROGRAMME****10. Specific Competencies**

10.1. Preamble: The salient feature of the revision of the medical curriculum in 2019 is the emphasis on learning which is competency-based, integrated and learner-centered acquisition of skills and ethical & humanistic values.

Each of the competencies described below must be read in conjunction with the goals of the medical education as listed in items 2 to 3.5.5

It is recommended that didactic teaching be restricted to less than one third of the total time allotted for that discipline. Greater emphasis is to be laid on hands-on training, symposia, seminars, small group discussions, problem-oriented and problem-based discussions and self-directed learning. Learners must be encouraged to take active part in and shared responsibility for their learning.

The global competencies to be achieved by the learner are outlined above in Chapter 1- section 3. Since the MBBS programme assessment will continue to be subject based, subject specific competencies have been outlined. These have to be acquired by the learner in the corresponding professional year. These competencies must be interpreted in the larger context outlined in section 3 and may be considered as “sub competencies” of the global competencies.

10.2. Integration must be horizontal (i.e. across disciplines in a given phase of the course) and vertical (across different phases of the course). As far as possible, it is desirable that teaching/learning occurs in each phase through study of organ systems or disease blocks in order to align the learning process. Clinical cases must be used to integrate and link learning across disciplines.

10.3. Pre-clinical Subjects**10.3.1. Human Anatomy**

(a) **Competencies:** The undergraduate must demonstrate:

1. Understanding of the gross and microscopic structure and development of human body,
2. Comprehension of the normal regulation and integration of the functions of the organs and systems on basis of the structure and genetic pattern,
3. Understanding of the clinical correlation of the organs and structures involved and interpret the anatomical basis of the disease presentations.

- (b) **Integration:** The teaching should be aligned and integrated horizontally and vertically in organ systems with clinical correlation that will provide a context for the learner to understand the relationship between structure and function and interpret the anatomical basis of various clinical conditions and procedures.

10.3.2. Physiology

- (a) **Competencies:** The undergraduates must demonstrate:
1. Understanding of the normal functioning of the organs and organ systems of the body,
 2. Comprehension of the normal structure and organization of the organs and systems on basis of the functions,
 3. Understanding of age-related physiological changes in the organ functions that reflect normal growth and development,
 4. Understand the physiological basis of diseases.
- (b) **Integration:** The teaching should be aligned and integrated horizontally and vertically in organ systems in order to provide a context in which normal function can be correlated both with structure and with the biological basis, its clinical features, diagnosis and therapy.

10.3.3. Biochemistry

The course will comprise Molecular and Cellular Biochemistry.

- (a) **Competencies:** The learner must demonstrate an understanding of:
1. Biochemical and molecular processes involved in health and disease,
 2. Importance of nutrition in health and disease,
 3. Biochemical basis and rationale of clinical laboratory tests, and demonstrate ability to interpret these in the clinical context.
- (b) **Integration:** The teaching/learning programme should be integrated horizontally and vertically, as much as possible, to enable learners to make clinical correlations and to acquire an understanding of the cellular and molecular basis of health and disease.

10.3.4. Introduction to Community Medicine

- (a) **Competencies:** The undergraduate must demonstrate:
1. Understanding of the concept of health and disease,
 2. Understanding of demography, population dynamics and disease burden in National and global context,
 3. Comprehension of principles of health economics and hospital management,
 4. Understanding of interventions to promote health and prevent diseases as envisioned in National and State Health Programmes.

10.4. Second Professional (Para-Clinical)

10.4.1. Pathology

- (a) **Competencies:** The undergraduate must demonstrate:
1. Comprehension of the causes, evolution and mechanisms of diseases,
 2. Knowledge of alterations in gross and cellular morphology of organs in disease states,
 3. Ability to correlate the natural history, structural and functional changes with the clinical manifestations of diseases, their diagnosis and therapy,
- (b) **Integration:** The teaching should be aligned and integrated horizontally and vertically in organ systems recognizing deviations from normal structure and function and clinically correlated so as to provide an overall understanding of the etiology, mechanisms, laboratory diagnosis, and management of diseases.

10.4.2. Microbiology

- (a) **Competencies:** The undergraduate learner demonstrate:
1. Understanding of role of microbial agents in health and disease,
 2. Understanding of the immunological mechanisms in health and disease,
 3. Ability to correlate the natural history, mechanisms and clinical manifestations of infectious diseases as they relate to the properties of microbial agents,
 4. Knowledge of the principles and application of infection control measures,
 5. An understanding of the basis of choice of laboratory diagnostic tests and their interpretation, antimicrobial therapy, control and prevention of infectious diseases.
- (b) **Integration:** The teaching should be aligned and integrated horizontally and vertically in organ systems with emphasis on host-microbe-environment interactions and their alterations in disease and clinical correlations so as to provide an overall understanding of the etiological agents, their laboratory diagnosis and prevention.

10.4.3. Pharmacology

- (a) **Competencies:** The undergraduate must demonstrate:
1. Knowledge about essential and commonly used drugs and an understanding of the pharmacologic basis of therapeutics,
 2. Ability to select and prescribe medicines based on clinical condition and the pharmacologic properties, efficacy, safety, suitability and cost of medicines for common clinical conditions of national importance,
 3. Knowledge of pharmacovigilance, essential medicine concept and sources of drug information and industry-doctor relationship,
 4. Ability to counsel patients regarding appropriate use of prescribed drug and drug delivery systems.
- (b) **Integration:** The teaching should be aligned and integrated horizontally and vertically in organ systems recognizing the interaction between drug, host and disease in order to provide an overall understanding of the context of therapy.

10.4.4. Forensic Medicine and Toxicology

- (a) **Competencies:** The learner must demonstrate:
1. Understanding of medico-legal responsibilities of physicians in primary and secondary care settings,
 2. Understanding of the rational approach to the investigation of crime, based on scientific and legal principles,
 3. Ability to manage medical and legal issues in cases of poisoning / overdose,
 4. Understanding the medico-legal framework of medical practice and medical negligence,
 5. Understanding of codes of conduct and medical ethics.
- (b) **Integration:** The teaching should be aligned and integrated horizontally and vertically recognizing the importance of medico-legal, ethical and toxicological issues as they relate to the practice of medicine.

10.4.5. Community Medicine – as per 10.3.4**10.5. Third Professional (Part I)****10.5.1. General Medicine**

- (a) **Competencies:** The student must demonstrate ability to do the following in relation to common medical problems of the adult in the community:

1. Demonstrate understanding of the patho-physiologic basis, epidemiological profile, signs and symptoms of disease and their investigation and management,
2. Competently interview and examine an adult patient and make a clinical diagnosis,
3. Appropriately order and interpret laboratory tests,
4. Initiate appropriate cost-effective treatment based on an understanding of the rational drug prescriptions, medical interventions required and preventive measures,
5. Follow up of patients with medical problems and refer whenever required,
6. Communicate effectively, educate and counsel the patient and family,
7. Manage common medical emergencies and refer when required,
8. Independently perform common medical procedures safely and understand patient safety issues.

(b) **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to provide sound biologic basis and incorporating the principles of general medicine into a holistic and comprehensive approach to the care of the patient.

10.5.2. General Surgery

(a) **Competencies:** The student must demonstrate:

1. Understanding of the structural and functional basis, principles of diagnosis and management of common surgical problems in adults and children,
2. Ability to choose, calculate and administer appropriately intravenous fluids, electrolytes, blood and blood products based on the clinical condition,
3. Ability to apply the principles of asepsis, sterilization, disinfection, rational use of prophylaxis, therapeutic utilities of antibiotics and universal precautions in surgical practice,
4. Knowledge of common malignancies in India and their prevention, early detection and therapy,
5. Ability to perform common diagnostic and surgical procedures at the primary care level,
6. Ability to recognize, resuscitate, stabilize and provide Basic & Advanced Life Support to patients following trauma,
7. Ability to administer informed consent and counsel patient prior to surgical procedures,
8. Commitment to advancement of quality and patient safety in surgical practice.

(b) **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to provide a sound biologic basis and a holistic approach to the care of the surgical patient.

10.5.3. Obstetrics and Gynaecology

(a) **Competencies in Obstetrics:** The student must demonstrate ability to:

1. Provide peri-conceptual counseling and antenatal care,
2. Identify high-risk pregnancies and refer appropriately,
3. Conduct normal deliveries, using safe delivery practices in the primary and secondary care settings,
4. Prescribe drugs safely and appropriately in pregnancy and lactation,
5. Diagnose complications of labor, institute primary care and refer in a timely manner,
6. Perform early neonatal resuscitation,
7. Provide postnatal care, including education in breast-feeding,
8. Counsel and support couples in the correct choice of contraception,

9. Interpret test results of laboratory and radiological investigations as they apply to the care of the obstetric patient,
10. Apply medico-legal principles as they apply to tubectomy, Medical Termination of Pregnancy (MTP), Pre-conception and Prenatal Diagnostic Techniques (PC PNDT Act) and other related Acts.

Competencies in Gynecology: The student must demonstrate ability to:

1. Elicit a gynecologic history, perform appropriate physical and pelvic examinations and PAP smear in the primary care setting,
 2. Recognize, diagnose and manage common reproductive tract infections in the primary care setting,
 3. Recognize and diagnose common genital cancers and refer them appropriately.
- (b) **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to provide comprehensive care for women in their reproductive years and beyond, based on a sound knowledge of structure, functions and disease and their clinical, social, emotional, psychological correlates in the context of national health priorities.

10.5.4. Pediatrics

(a) **Competencies:** The student must demonstrate:

1. Ability to assess and promote optimal growth, development and nutrition of children and adolescents and identify deviations from normal,
2. Ability to recognize and provide emergency and routine ambulatory and First Level Referral Unit care for neonates, infants, children and adolescents and refer as may be appropriate,
3. Ability to perform procedures as indicated for children of all ages in the primary care setting,
4. Ability to recognize children with special needs and refer appropriately,
5. Ability to promote health and prevent diseases in children,
6. Ability to participate in National Programmes related to child health and in conformation with the Integrated Management of Neonatal and Childhood Illnesses (IMNCI) Strategy,
7. Ability to communicate appropriately and effectively.

(b) **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to provide comprehensive care for neonates, infants, children and adolescents based on a sound knowledge of growth, development, disease and their clinical, social, emotional, psychological correlates in the context of national health priorities.

10.5.5. Orthopaedics (including Trauma)

(a) **Competencies:** The student must demonstrate:

1. Ability to recognize and assess bone injuries, dislocation and poly-trauma and provide first contact care prior to appropriate referral,
2. Knowledge of the medico-legal aspects of trauma,
3. Ability to recognize and manage common infections of bone and joints in the primary care setting,
4. Recognize common congenital, metabolic, neoplastic, degenerative and inflammatory bone diseases and refer appropriately,
5. Ability to perform simple orthopaedic techniques as applicable to a primary care setting,
6. Ability to recommend rehabilitative services for common orthopaedic problems across all ages.

(b) **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to allow the student to understand the structural basis of orthopaedic problems, their management and correlation with function, rehabilitation and quality of life.

10.5.6. Forensic Medicine and Toxicology – as per 10.4.4**10.5.7. Community medicine**

(a) **Competencies:** The learner must demonstrate:

1. Understanding of physical, social, psychological, economic and environmental determinants of health and disease,
2. Ability to recognize and manage common health problems including physical, emotional and social aspects at individual family and community level in the context of National Health Programmes,
3. Ability to Implement and monitor National Health Programmes in the primary care setting,
4. Knowledge of maternal and child wellness as they apply to national health care priorities and programmes,
5. Ability to recognize, investigate, report, plan and manage community health problems including malnutrition and emergencies.

(b) **Integration:** The teaching should be aligned and integrated **horizontally** and vertically in order to allow the learner to understand the impact of environment, society and national health priorities as they relate to the promotion of health and prevention and cure of disease.

10.5.8. Dermatology, Venereology & Leprosy

(a) **Competencies:** The undergraduate student must demonstrate:

1. Understanding of the principles of diagnosis of diseases of the skin, hair, nail and mucosa,
2. Ability to recognize, diagnose, order appropriate investigations and treat common diseases of the skin including leprosy in the primary care setting and refer as appropriate,
3. A syndromic approach to the recognition, diagnosis, prevention, counseling, testing and management of common sexually transmitted diseases including HIV based on national health priorities,
4. Ability to recognize and treat emergencies including drug reactions and refer as appropriate.

(b) **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to emphasize the biologic basis of diseases of the skin, sexually transmitted diseases and leprosy and to provide an understanding that skin diseases may be a manifestation of systemic disease.

10.5.9. Psychiatry

(a) **Competencies:** The student must demonstrate:

1. Ability to promote mental health and mental hygiene,
2. Knowledge of etiology (bio-psycho-social-environmental interactions), clinical features, diagnosis and management of common psychiatric disorders across all ages,
3. Ability to recognize and manage common psychological and psychiatric disorders in a primary care setting, institute preliminary treatment in disorders difficult to manage, and refer appropriately,
4. Ability to recognize alcohol/ substance abuse disorders and refer them to appropriate centers,
5. Ability to assess risk for suicide and refer appropriately,
6. Ability to recognize temperamental difficulties and personality disorders,
7. Assess mental disability and rehabilitate appropriately,
8. Understanding of National and State programmes that address mental health and welfare of patients and community.

(b) **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to allow the student to understand bio-psycho-social-environmental interactions that lead to diseases/ disorders for preventive, promotive, curative, rehabilitative services and medico-legal implications in the care of patients both in family and community.

10.5.10 Respiratory Medicine

(a) **Competencies:** The student must demonstrate:

1. Knowledge of common chest diseases, their clinical manifestations, diagnosis and management,
2. Ability to recognize, diagnose and manage pulmonary tuberculosis as contemplated in National Tuberculosis Control programme,
3. Ability to manage common respiratory emergencies in primary care setting and refer appropriately.

(b) **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to allow the student to recognize diagnose and treat TB in the context of the society, national health priorities, drug resistance and co-morbid conditions like HIV.

10.5.11 Otorhinolaryngology

(a) **Competencies:** The learner must demonstrate:

1. Knowledge of the common Otorhinolaryngological (ENT) emergencies and problems,
2. Ability to recognize, diagnose and manage common ENT emergencies and problems in primary care setting,
3. Ability to perform simple ENT procedures as applicable in a primary care setting,
4. Ability to recognize hearing impairment and refer to the appropriate hearing impairment rehabilitation programme.

(b) **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to allow the learner to understand the structural basis of ENT problems, their management and correlation with function, rehabilitation and quality of life.

10.5.12 Ophthalmology

(a) **Competencies:** The student must demonstrate:

1. Knowledge of common eye problems in the community
2. Recognize, diagnose and manage common eye problems and identify indications for referral,
3. Ability to recognize visual impairment and blindness in the community and implement National programmes as applicable in the primary care setting.

(b) **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to allow the student to understand the structural basis of ophthalmologic problems, their management and correlation with function, rehabilitation and quality of life.

10.5.13a Radiodiagnosis

(a) **Competencies:** The student must demonstrate:

1. Understanding of indications for various radiological investigations in common clinical practice,
2. Awareness of the ill effects of radiation and various radiation protective measures to be employed,
3. Ability to identify abnormalities in common radiological investigations.

(b) **Integration:** Horizontal and vertical integration to understand the fundamental principles of radiologic imaging, anatomic correlation and their application in diagnosis and therapy.

10.5.13b Radiotherapy

(a) **Competencies:** The student must demonstrate understanding of:

1. Clinical presentations of various cancers,
2. Appropriate treatment modalities for various types of malignancies,
3. Principles of radiotherapy and techniques.

- (b) **Integration:** Horizontal and vertical integration to enable basic understanding of fundamental principles of radio-therapeutic procedures.

10.5.14 Anaesthesiology

(a) **Competencies in Anaesthesiology:** The student must demonstrate ability to:

1. Describe and discuss the pre-operative evaluation, assessing fitness for surgery and the modifications in medications in relation to anaesthesia / surgery,
2. Describe and discuss the roles of Anaesthesiologist as a peri-operative physician including pre-medication, endotracheal intubation, general anaesthesia and recovery (including variations in recovery from anaesthesia and anaesthetic complications),
3. Describe and discuss the management of acute and chronic pain, including labour analgesia,
4. Demonstrate awareness about the maintenance of airway in children and adults in various situations,
5. Demonstrate the awareness about the indications, selection of cases and execution of cardio-pulmonary resuscitation in emergencies and in the intensive care and high dependency units,
6. Choose cases for local / regional anaesthesia and demonstrate the ability to administer the same,
7. Discuss the implications and obtain informed consent for various procedures and to maintain the documents.

(b) **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to provide comprehensive care for patients undergoing various surgeries, in patients with pain, in intensive care and in cardio respiratory emergencies. Integration with the preclinical department of Anatomy, para- clinical department of Pharmacology and horizontal integration with any/all surgical specialities is proposed.

10.6. Third Professional (Part II)

10.6.1. General Medicine – as per 10.5.1

10.6.2. General Surgery – as per 10.5.2

10.6.3. Obstetrics & Gynaecology – as per 10.5.3

10.6.4. Pediatrics – as per 10.5.4

10.6.5. Orthopaedics – as per 10.5.5

CHAPTER VI ASSESSMENT

11. Assessment

11.1. Eligibility to appear for Professional examinations

11.1.1. The performance in essential components of training are to be assessed, based on:

(a) Attendance

1. Attendance requirements are 75% in theory and 80% in practical /clinical for eligibility to appear for the examinations in that subject. In subjects that are taught in more than one phase – the learner must have 75% attendance in theory and 80% in practical in each phase of instruction in that subject.
2. If an examination comprises more than one subject (for e.g., General Surgery and allied branches), the candidate must have 75% attendance in each subject and 80% attendance in each clinical posting.
3. Learners who do not have at least 75% attendance in the electives will not be eligible for the Third Professional - Part II examination.

(b) **Internal Assessment:** Internal assessment shall be based on day-to-day assessment. It shall relate to different ways in which learners participate in learning process including assignments, preparation for seminar, clinical case presentation, preparation of clinical case for discussion, clinical case study/problem solving exercise, participation in project for health

care in the community, proficiency in carrying out a practical or a skill in small research project, a written test etc.

1. Regular periodic examinations shall be conducted throughout the course. There shall be no less than three internal assessment examinations in each Preclinical / Para-clinical subject and no less than two examinations in each clinical subject in a professional year. An end of posting clinical assessment shall be conducted for each clinical posting in each professional year.
2. When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.
3. Day to day records and log book (including required skill certifications) should be given importance in internal assessment. Internal assessment should be based on competencies and skills.
4. The final internal assessment in a broad clinical specialty (e.g., Surgery and allied specialties etc.) shall comprise of marks from all the constituent specialties. The proportion of the marks for each constituent specialty shall be determined by the time of instruction allotted to each.
5. Learners must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in a particular subject in order to be eligible for appearing at the final University examination of that subject. Internal assessment marks will reflect as separate head of passing at the summative examination.
6. The results of internal assessment should be displayed on the notice board within a 1-2 weeks of the test. Universities shall guide the colleges regarding formulating policies for remedial measures for students who are either not able to score qualifying marks or have missed on some assessments due to any reason.
7. Learners must have completed the required certifiable competencies for that phase of training and completed the log book appropriate for that phase of training to be eligible for appearing at the final university examination of that subject.

University Examinations

- 11.2.1 University examinations are to be designed with a view to ascertain whether the candidate has acquired the necessary knowledge, minimal level of skills, ethical and professional values with clear concepts of the fundamentals which are necessary for him/her to function effectively and appropriately as a physician of first contact. Assessment shall be carried out on an objective basis to the extent possible.
- 11.2.2 Nature of questions will include different types such as structured essays (Long Answer Questions - LAQ), Short Answers Questions (SAQ) and objective type questions (e.g. Multiple Choice Questions - MCQ). Marks for each part should be indicated separately. MCQs shall be accorded a weightage of not more than 20% of the total theory marks. In subjects that have two papers, the learner must secure at least 40% marks in each of the papers with minimum 50% of marks in aggregate (both papers together) to pass.
- 11.2.3 Practical/clinical examinations will be conducted in the laboratories and /or hospital wards. The objective will be to assess proficiency and skills to conduct experiments, interpret data and form logical conclusion. Clinical cases kept in the examination must be common conditions that the learner may encounter as a physician of first contact in the community. Selection of rare syndromes and disorders as examination cases is to be discouraged. Emphasis should be on candidate's capability to elicit history, demonstrate physical signs, write a case record, analyze the case and develop a management plan.
- 11.2.4 Viva/oral examination should assess approach to patient management, emergencies, attitudinal, ethical and professional values. Candidate's skill in interpretation of common investigative data, X-rays, identification of specimens, ECG, etc. is to be also assessed.
- 11.2.5 There shall be one main examination in an academic year and a supplementary to be held not later than 90 days after the declaration of the results of the main examination.

11.2.6 A learner shall not be entitled to graduate after 10 years of his/her joining of the first part of the MBBS course.

11.2.7 University Examinations shall be held as under:

(a) First Professional

1. The first Professional examination shall be held at the end of first Professional training (1+12 months), in the subjects of Human Anatomy, Physiology and Biochemistry.
2. A maximum number of four permissible attempts would be available to clear the first Professional University examination, whereby the first Professional course will have to be cleared within 4 years of admission to the said course. Partial attendance at any University examination shall be counted as an availed attempt.

(b) Second Professional

1. The second Professional examination shall be held at the end of second professional training (11 months), in the subjects of Pathology, Microbiology, and Pharmacology.

(c) Third Professional

1. Third Professional Part I shall be held at end of third Professional part 1 of training (12 months) in the subjects of Ophthalmology, Otorhinolaryngology, Community Medicine and Forensic Medicine and Toxicology
2. Third Professional Part II - (Final Professional) examination shall be at the end of training (14 months including 2 months of electives) in the subjects of General Medicine, General Surgery, Obstetrics & Gynecology and Pediatrics. The discipline of Orthopedics, Anesthesiology, Dentistry and Radiodiagnosis will constitute 25% of the total theory marks incorporated as a separate section in paper II of General Surgery.
3. The discipline of Psychiatry and Dermatology, Venereology and Leprosy (DVL), Respiratory Medicine including Tuberculosis will constitute 25% of the total theory marks in General Medicine incorporated as a separate section in paper II of General Medicine.

(d) Examination schedule is in Table 1.

(e) Marks distribution is in Table 10.

Table 10 : Marks distribution for various subjects

Phase of Course	Written-Theory – Total	Practicals/Orals/Clinicals	Pass Criteria
First Professional			<u>Internal Assessment:</u> 50% combined in theory and practical (not less than 40% in each) for eligibility for appearing for University Examinations
Human Anatomy - 2 papers	200	100	
Physiology - 2 papers	200	100	
Biochemistry - 2 papers	200	100	
Second Professional			
Pharmacology - 2 Papers	200	100	
Pathology - 2 papers	200	100	<u>University Examination</u> Mandatory 50% marks separately in theory and practical (practical = practical/clinical + viva)
Microbiology - 2 papers	200	100	
Third Professional Part – I			
Forensic Medicine & Toxicology - 1 paper	100	100	
Ophthalmology – 1 paper	100	100	

Otorhinolaryngology – 1 paper	100	100
Community Medicine - 2 papers	200	100
Third Professional Part – II		
General Medicine - 2 papers	200	200
General Surgery - 2 papers	200	200
Pediatrics – 1 paper	100	100
Obstetrics & Gynaecology - 2 papers	200	200

Note: At least one question in each paper of the clinical specialties should test knowledge - competencies acquired during the professional development programme (AETCOM module); Skills competencies acquired during the Professional Development programme (AETCOM module) must be tested during clinical, practical and viva.

In subjects that have two papers, the learner must secure at least 40% marks in each of the papers with minimum 50% of marks in aggregate (both papers together) to pass in the said subject.

11.2.8 **Criteria for passing in a subject:** A candidate shall obtain 50% marks in University conducted examination separately in Theory and Practical (practical includes: practical/ clinical and viva voce) in order to be declared as passed in that subject.

11.2.9 **Appointment of Examiners**

- (a) Person appointed as an examiner in the particular subject must have at least four years of total teaching experience as assistant professor after obtaining postgraduate degree in the subject in a college affiliated to a recognized/approved/permited medical college.
- (b) For the Practical/ Clinical examinations, there shall be at least four examiners for 100 learners, out of whom not less than 50% must be external examiners. Of the four examiners, the senior-most internal examiner will act as the Chairman and coordinator of the whole examination programme so that uniformity in the matter of assessment of candidates is maintained. Where candidates appearing are more than 100, two additional examiners (one external & one internal) for every additional 50 or part there of candidates appearing, be appointed.
- (c) In case of non-availability of medical teachers, approved teachers without a medical degree (engaged in the teaching of MBBS students as whole-time teachers in a recognized medical college), may be appointed examiners in their concerned subjects provided they possess requisite doctorate qualifications and four years teaching experience (as assistant professors) of MBBS students. Provided further that the 50% of the examiners (Internal & External) are from the medical qualification stream.
- (d) External examiners may not be from the same University.
- (e) The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his/her subject.
- (f) A University having more than one college shall have separate sets of examiners for each college, with internal examiners from the concerned college.
- (g) External examiners shall rotate at an interval of 2 years.
- (h) There shall be a Chairman of the Board of paper-setters who shall be an internal examiner and shall moderate the questions.
- (i) All eligible examiners with requisite qualifications and experience can be appointed internal examiners by rotation in their subjects.
- (j) All theory paper assessment should be done as central assessment program (CAP) of concerned university.
- (k) Internal examiners should be appointed from same institution for unitary examination in same institution. For pooled examinations at one centre approved internal examiners from same university may be appointed.
- (l) The grace marks up to a maximum of five marks may be awarded at the discretion of the University to a learner for clearing the examination as a whole but not for clearing a subject resulting in exemption.

CHAPTER VII
INTERNSHIP

12. INTERNSHIP

Internship is a phase of training wherein a graduate will acquire the skills and competencies for practice of medical and health care under supervision so that he/she can be certified for independent medical practice as an Indian Medical Graduate. In order to make trained work force available, it may be considered as a phase of training wherein the graduate is expected to conduct actual practice under the supervision of a trained doctor. The learning methods and modalities have to be done during the MBBS course itself with larger number of hands on session and practice on simulators.

12.1. Goal:

The goal of the internship programme is to train medical students to fulfill their roles as doctors of first contact in the community.

12.2 Objectives: At the end of the internship period, the medical graduate will possess all competencies required of an Indian Medical Graduate, namely:

- 12.2.1 Independently provide preventive, promotive, curative and palliative care with compassion,
- 12.2.2 Function as leader and member of the health care team and health system,
- 12.2.3 Communicate effectively with patients, families, colleagues and the community,
- 12.2.4 Be certified in diagnostic and therapeutic skills in different disciplines of medicine taught in the undergraduate programme,
- 12.2.5 Be a lifelong learner committed to continuous improvement of skills and knowledge,
- 12.2.6 Be a professional committed to excellence and is ethical, responsive and accountable to patients, community and profession.

12.3 Time Distribution

Community Medicine (Residential posting)	2 months
General Medicine including 15 days of Psychiatry	2 months
General Surgery including 15 days Anaesthesia	2 months
Obstetrics & Gynaecology including Family Welfare Planning	2 months
Pediatrics	1 month
Orthopaedics including PM & R	1 month
Otorhinolaryngology	15 days
Ophthalmology	15 days
Casualty	15 days
Elective posting (1x15 days)	15 days

Subjects for Elective posting will be as follows:

1. Dermatology, Venereology & Leprosy
2. Respiratory Medicine
3. Radio diagnosis
4. Forensic Medicine & Toxicology
5. Blood Bank
6. Psychiatry

Note: Structure internship with assessment at the end in the college.

12.4 Other details:

- 12.4.1 The core rotations of the internship shall be done in primary and secondary/ tertiary care institutions in India. In case of any difficulties, the matter may be referred to the Medical Council of India to be considered on individual merit.
- 12.4.2 Every candidate will be required after passing the final MBBS examination to undergo compulsory rotational internship to the satisfaction of the College authorities and University concerned for a period of 12 months so as to be eligible for the award of the degree of Bachelor of Medicine and Bachelor of Surgery (MBBS) and full registration.
- 12.4.3 The University shall issue a provisional MBBS pass certificate on passing the final examination.
- 12.4.4 The State Medical Council will grant provisional registration to the candidate upon production of the provisional MBBS pass certificate. The provisional registration will be for a period of one year. In the event of the shortage or unsatisfactory work, the period of provisional registration and the compulsory rotating internship shall be suitably extended by the appropriate authorities.
- 12.4.5 The intern shall be entrusted with clinical responsibilities under direct supervision of a designated supervising physician. They shall not work independently.
- 12.4.6 Interns will not issue medical certificate or death certificate or other medico-legal document under their signature.
- 12.4.7 Each medical college must ensure that the student gets learning experience in primary/secondary and urban/rural centers in order to provide a diverse learning experience and facilitate the implementation of national health programmes/ priorities. These shall include community and outreach activities, collaboration with rural and urban community health centers, participation in government health missions etc.
- 12.4.8 One year's approved service in the Armed Forces Medical Services, after passing the final MBBS examination shall be considered as equivalent to the pre-registration training detailed above; such training shall, as far as possible, be at the Base/General Hospital. The training in Community Medicine should fulfill the norms of the MCI as proposed above.
- 12.4.9 In recognition of the importance of hands-on experience, full responsibility for patient care and skill acquisition, internship should be increasingly scheduled to utilize clinical facilities available in District Hospital, Taluka Hospital, Community Health Centre and Primary Health Centre, in addition to Teaching Hospital. A critical element of internship will be the acquisition of specific experiences and skill as listed in major areas: provided that where an intern is posted to District/Sub Divisional Hospital for training, there shall be a committee consisting of representatives of the college/University, the State Government and the District administration, who shall regulate the training of such trainee. Provided further that, for such trainee a certificate of satisfactory completion of training shall be obtained from the relevant administrative authorities which shall be countersigned by the Principal/Dean of College.

12.5 Assessment of Internship:

- 12.5.1 The intern shall maintain a record of work in a log book, which is to be verified and certified by the medical officer under whom he/she works. Apart from scrutiny of the record of work, assessment and evaluation of training shall be undertaken by an objective approach using situation tests in knowledge, skills and attitude during and at the end of the training.
- 12.5.2 Based on the record of work and objective assessment at the end of each posting, the Dean/Principal shall issue cumulative certificate of satisfactory completion of training at the end of internship, following which the University shall award the MBBS degree or declare him eligible for it.
- 12.5.3 Full registration shall only be given by the State Medical Council/Medical Council of India on the award of the MBBS degree by the University or its declaration that the candidate is eligible for it.
- 12.5.4 Some guidelines for the implementation of the training programme are given below.

12.6 **INTERNSHIP – DISCIPLINE RELATED:****12.6.1 COMMUNITY MEDICINE****GOAL:**

The aim of teaching the undergraduate student in Community Medicine is to impart such knowledge and skills that may enable him to diagnose and treat common medical illnesses and recognize the importance of community involvement. He/she shall acquire competence to deal effectively with an individual and the community in the context of primary health care. This is to be achieved by hands-on experience in the District Hospital and Primary Health Centre. The details are as under: -

I) District Hospital /Community Health Centre/Attachment to General Practitioner:**A. An intern must be able to do without assistance:**

1. An intern must:
 - a) Be able to diagnose common ailments and advise primary care;
 - b) Demonstrate knowledge on 'Essential drugs' and their usage;
 - c) Recognize medical emergencies, resuscitate and institute initial treatment and refer to a suitable institution.
2. An intern must be familiar with all National Health Programmes (e.g. RCH, UIP, CDD, ARI, FP, ANC, Tuberculosis, Leprosy and others), as recommended by the Ministry of Health and Family Welfare.
3. An intern must:
 - a) Gain full expertise in immunization against infectious disease;
 - b) Participate in programmes related to prevention and control of locally prevalent endemic diseases including nutritional disorders;
 - c) Learn skills in family welfare planning procedures;
4. An intern must:
 - a) Conduct programmes on health education,
 - b) Gain capabilities to use Audiovisual aids,
 - c) Acquire capability of utilization of scientific information for promotion of community health

B. An intern must have observed or preferably assisted at the following:

1. An intern should be capable of establishing linkages with other agencies as water supply, food distribution and other environmental/social agencies.
2. An intern should acquire managerial skills including delegation of duties to and monitoring the activities of paramedical staff and other health professionals.

II) Taluka Hospital/ First Referral Unit**A. An intern must be able to do without assistance:**

1. An intern shall provide health education to an individual/community on:
 - a) tuberculosis,
 - b) small family, spacing, use of appropriate contraceptives,
 - c) applied nutrition and care of mothers and children,
 - d) immunization.

B. An intern must be able to do with supervision:

An intern shall attend at least one school health programme with the medical officer.

III) Primary Health Centre / Urban Health Centre**A. An intern must be able to do without assistance the following:**

- a) Participate in family composite health care (birth to death), inventory of events.
- b) Participate in use of the modules on field practice for community health e.g. safe motherhood, nutrition surveillance and rehabilitation, diarrheal disorders etc.

- c) Participate in and maintain documents related to immunization and cold chain.
- d) Acquire competence in diagnosis and management of common ailments e.g. malaria, tuberculosis, enteric fever, congestive heart failure, hepatitis, meningitis acute renal failure etc.

B. An intern must be able to do under supervision the following:

- a) Acquire proficiency in Family Welfare Programmes (antenatal care, normal delivery, contraception etc.).
- b) Undergo village attachment of at least one week duration to understand issues of community health along with exposure to village health centres, ASHA Sub Centres.
- c) Participate in Infectious Diseases Surveillance and Epidemic Management activities along with the medical officer.

12.6.2 GENERAL MEDICINE

GOAL:

The aim of teaching the undergraduate student in General Medicine is to impart such knowledge and skills that may enable him to diagnose and treat common medical illnesses. He/she shall acquire competence in clinical diagnosis based on history, physical examination and relevant laboratory investigations and institute appropriate line of management; this would include diseases common in tropics (parasitic, bacterial or viral infections, nutritional disorders, including dehydration and electrolyte disturbances) and various system illnesses.

A. An intern must be able to do without assistance and interpret the results of:

- i. the following laboratory investigations:
 - a) Blood: (Routine haematology smear and blood groups),
 - b) Urine: (Routine chemical and microscopic examination),
 - c) Stool: (for ova/cyst and occult blood),
 - d) Sputum and throat swab for gram stain or acid-fast stain, and
 - e) Cerebrospinal Fluid (CSF) for smear,
 - f) Electrocardiogram (ECG),
 - g) Glucometer recording of blood sugar,
 - h) routine radiographs of chest, abdomen, skull etc.
- ii. Perform independently the following:
 - a) diagnostic procedures
 - Proctoscopy,
 - Ophthalmoscopy/Otoscopy,
 - Indirect laryngoscopy.
 - b) Therapeutic procedures;
 - Urethral catheterization,
 - Insertion of Ryle's Tube,
 - Pleural, Ascitic fluid aspiration,
 - Cerebrospinal Fluid (CSF) aspiration,
 - Air way tube installation,
 - Oxygen administration etc.

B. An intern must have observed or preferably assisted at the following operations/ procedures:

- a) **Biopsy Procedures:** Liver, Kidney, Skin, Nerve, Lymph node, and muscle biopsy, Bone marrow aspiration, Biopsy of Malignant lesions on surface, nasal/nerve/skin smear for leprosy under supervision.

C. Skills that an intern should be able to perform under supervision:

- a) An intern should be familiar with lifesaving procedures, including use of aspirator, respirator and defibrillator, cardiac monitor, blood gas analyser.
- b) An intern should be able to advise about management and prognosis of acute & chronic illnesses like viral fever, gastroenteritis, hepatitis, pneumonias, myocardial infarction and angina, TIA and stroke, seizures, diabetes mellitus, hypertension renal and hepatic failure, thyroid disorders and hematological disorders. He should participate in counseling sessions for patients with non-communicable diseases and tuberculosis, HIV patients etc.
- c) Intern should be able to confirm death and demonstrate understanding of World Health Organisation cause of death reporting and data quality requirements.
- d) Intern should be able to demonstrate understanding of the coordination with local and national epidemic management plans.
- e) Intern shall be able to demonstrate prescribing skills and demonstrate awareness of pharmacovigilance, antibiotics policy, prescription audit and concept of essential medicines list.

12.6.3: PEDIATRICS:**GOAL:**

The aim of teaching the undergraduate student in Pediatrics is to impart such knowledge and skills that may enable him to diagnose and treat common childhood illnesses including neonatal disorders. He/she shall acquire competence for clinical diagnosis based on history, physical examination and relevant laboratory investigations and institute appropriate line of management; this would include diseases common in tropics (parasitic, bacterial or viral infections, nutritional disorders, including dehydration and electrolyte disturbances) and various system illnesses.

A. An intern must be able to do without assistance:

An intern shall be able to diagnose and manage common childhood disorders including neonatal disorders and acute emergencies, examining sick child making a record of information.

An intern shall perform:

- a) **diagnostic techniques:** blood collection (including from femoral vein and umbilical cord), drainage of abscess, collection of cerebrospinal, pleural and peritoneal fluids, suprapubic aspiration of urine.
- b) **techniques related to patient care:** immunization, perfusion techniques, nasogastric tube insertion, feeding procedures, tuberculin testing & breast-feeding counseling.
- c) **use of equipments:** vital monitoring, temperature monitoring, resuscitation at birth and care of children receiving intensive care.
- d) institute early management of common childhood disorders with special reference to pediatric dosage and oral rehydration therapy.

B. An intern must have observed or preferably assisted at the following operations/ procedures:

- a) screening of newborn babies and those with risk factors for any anomalies and steps for prevention in future; detect congenital abnormalities;
- b) recognise growth abnormalities; recognise anomalies of psychomotor development;
- c) assess nutritional and dietary status of infants and children and organize prevention, detection and follow up of deficiency disorders both at individual and community levels, such as:
 - protein-energy malnutrition
 - deficiencies of vitamins especially A, B, C and D;
 - Iron deficiency

C. Skills that an intern should be able to perform under supervision:

- a) An intern should be familiar with life-saving procedures, including use of aspirator, respirator, cardiac monitor, blood gas analyser.
- b) An intern should be able to advise about management and prognosis of acute & chronic illnesses like viral fever, gastroenteritis, hepatitis, pneumonias, congenital heart diseases, seizures, renal and hepatic diseases, thyroid disorders and hematological disorders. She/he should participate in counseling sessions with parents including HIV counseling.

12.6.4: GENERAL SURGERY**GOAL:**

The aim of teaching the undergraduate student in General Surgery is to impart such knowledge and skills that may enable him to diagnose and treat common surgical ailments. He/she shall have ability to diagnose and suspect with reasonable accuracy all acute and chronic surgical illnesses.

(A) THERAPEUTIC- An intern must perform or assist in:

- a) venesection or venous access
- b) tracheostomy and endotracheal intubation
- c) catheterization of patients with acute retention or trocar cystostomy
- d) drainage of superficial abscesses
- e) basic suturing of wound and wound management (including bandaging)
- f) biopsy of surface tumours
- g) perform vasectomy

(B) Skill that an intern should be able to perform under supervision:

- a) Advise about prognosis of acute & chronic surgical illnesses, head injury, trauma, burns and cancer. Counsel patients regarding the same.
- b) Advise about rehabilitation of patients after surgery and assist them for early recovery.
- c) Intern should be able to demonstrate understanding of World Health Organisation cause of death reporting and data quality requirements.
- d) Intern should be able to demonstrate understanding of the use of national and sub-national cause of death statistics.

(C) An intern must have observed or preferably assisted at the following operations/procedures:

- a) Resuscitation of critical patients
- b) Basic surgical procedures for major and minor surgical illnesses
- c) Wound dressings and application of splints
- d) Laparoscopic/ Minimally Invasive surgery
- e) Lymph node biopsy

12.6.5: CASUALTY:**GOAL:**

The aim of teaching the undergraduate student in casualty is to impart such knowledge and skills that may enable him/her to diagnose and treat common acute surgical/medical ailments. He/she shall have ability to diagnose and suspect, with reasonable accuracy, acute surgical illnesses including emergencies, resuscitate critically injured patient and a severely burned patient, control surface bleeding and manage open wounds and monitor and institute first-line management of patients of head, spine, chest, abdominal and pelvic injury as well as acute abdomen.

(A) THERAPEUTIC- An intern must perform or assist in:

- a) Identification of acute emergencies in various disciplines of medical practice,
- b) Management of acute anaphylactic shock,
- c) Management of peripheral-vascular failure and shock,
- d) Management of acute pulmonary edema and Left Ventricular Failure (LVF),
- e) Emergency management of drowning, poisoning and seizure,
- f) Emergency management of bronchial asthma and status asthmaticus,
- g) Emergency management of hyperpyrexia,

- h) Emergency management of comatose patients regarding airways, positioning, prevention of aspiration and injuries,
- i) Assessment and administering emergency management of burns,
- j) Assessing and implementing emergency management of various trauma victims,
- k) Identification of medico-legal cases and learn filling up of forms as well as complete other medico-legal formalities in cases of injury, poisoning, sexual offenses, intoxication and other unnatural conditions.

(B) Skill that an intern should be able to perform under supervision:

- a) Advise about prognosis of acute surgical illnesses, head injury, trauma and burns. Counsel patients regarding the same.

(C) An intern must have observed or preferably assisted at the following operations/ procedures:

- a) Resuscitation of critical patients
- b) documentation medico legal cases
- c) management of bleeding and application of splints;

12.6.6: OBSTETRICS AND GYNAECOLOGY

GOAL:

The aim of teaching the undergraduate student in Obstetrics & Gynaecology is to impart such knowledge and skills that may enable him to diagnose and manage antenatal and post natal follow up; manage labor and detect intrapartum emergencies; diagnose and treat common gynaecologic ailments.

(A) THERAPEUTIC- An intern must perform or assist in:

- a) Diagnosis of early pregnancy and provision of ante-natal care; antenatal pelvic assessment and detection of cephalopelvic disproportion,
- b) Diagnosis of pathology of pregnancy related to:
 - abortion
 - ectopic pregnancy
 - tumours complicating pregnancy
 - acute abdomen in early pregnancy
 - hyperemesis gravidarum,
- c) Detection of high risk pregnancy cases and give suitable advice e.g. PIH, hydramanios, antepartum haemorrhage, multiple pregnancies, abnormal presentations and intra-uterine growth retardation,
- d) Induction of labor and amniotomy under supervision,
- e) Induction of labor and amniotomy under supervision,
- f) Management of normal labor, detection of abnormalities, post-partum hemorrhage and repair of perennial tears,
- g) Assist in forceps delivery,
- h) Detection and management of abnormalities of lactation,
- i) Evaluation and prescription oral contraceptives with counseling,
- j) Per speculum, per vaginum and per rectal examination for detection of common congenital, inflammatory, neoplastic and traumatic conditions of vulva, vagina, uterus and ovaries,
- k) Medico-legal examination in Gynecology and Obstetrics.

(B) Skills that an intern should be able to perform under supervision:

- a) Dilatation and curettage and fractional curettage,
- b) Endometrial biopsy,
- c) Endometrial aspiration,
- d) Pap smear collection,
- e) Intra Uterine Contraceptive Device (IUCD) insertion,
- f) Minilap ligation,
- g) Urethral catheterization,

- h) Suture removal in postoperative cases,
- i) Cervical punch biopsy.

(C) An intern must have observed or preferably assisted at the following operations/ procedures:

- a) Major abdominal and vaginal surgery cases,
- b) Second trimester Medical Termination of Pregnancy (MTP) procedures
e.g. Emcredyl Prostaglandin instillations, Caesarean section.

12.6.7 OTORHINOLARYNGOLOGY (ENT)

GOAL:

The aim of teaching the undergraduate student in ophthalmology is to impart such knowledge and skills that may enable him to diagnose and treat common otorhinolaryngological conditions such as ear pain, foreign bodies and acquire ability for a comprehensive diagnosis of common Ear, Nose and Throat (ENT) diseases including emergencies and malignant neoplasms of the head and neck.

(A) THERAPEUTIC- An intern must perform or assist in:

- a) Ear syringing, antrum puncture and packing of the nose for epistaxis,
- b) Nasal douching and packing of the external canal,
- c) Removing foreign bodies from nose and ear,
- d) Observing or assisting in various endoscopic procedures and tracheostomy.

(B) Skill that an intern should be able to perform under supervision:

- a) Intern shall have participated as a team member in the diagnosis of various ENT- related diseases and be aware of National programme on prevention of deafness,
- b) Intern shall acquire knowledge of various ENT related rehabilitative programmes.

(C) An intern must have observed or preferably assisted at the following operations/ procedures:

- a) Intern shall acquire skills in the use of head mirror, otoscope and indirect laryngoscopy and first line of management of common Ear Nose and Throat (ENT) problems.

12.6.8 OPHTHALMOLOGY

GOAL:

The aim of teaching the undergraduate student in ophthalmology is to impart such knowledge and skills that may enable him to diagnose and treat common ophthalmological conditions such as Trauma, Acute conjunctivitis, allergic conjunctivitis, xerosis, entropion, corneal ulcer, iridocyclitis, myopia, hypermetropia, cataract, glaucoma, ocular injury and sudden loss of vision.

(A) THERAPEUTIC- An intern must perform or assist in:

- a) Subconjunctival injection
- b) Ocular bandaging
- c) Removal of concretions
- d) Epilation and electrolysis
- e) Corneal foreign body removal
- f) Cauterization of corneal ulcers
- g) Chalazion removal
- h) Entropion correction
- i) Suturing conjunctival tears
- j) Lids repair
- k) Glaucoma surgery (assisted)
- l) Enucleation of eye in cadaver.

(B) Skill that an intern should be able to perform under supervision:

- (a) Advise regarding methods for rehabilitation of the blind.

(C) An intern must have observed or preferably assisted at the following operations/ procedures:

- a) Assessment of refractive errors and advise its correction,
- b) Diagnose ocular changes in common systemic disorders,
- c) Perform investigative procedures such as tonometry, syringing, direct ophthalmoscopy, subjective refraction and fluorescein staining of cornea.

12.6.9 ORTHOPAEDICS**GOAL:**

The aim of teaching the undergraduate student in Orthopaedics and Physical Medicine and Rehabilitation is to impart such knowledge and skills that may enable him to diagnose and treat common ailments. He/she shall have ability to diagnose and suspect presence of fracture, dislocation, actual osteomyelitis, acute poliomyelitis and common congenital deformities such as congenital talipesequinovarus (CTEV) and dislocation of hip (CDH).

(A) THERAPEUTIC- An intern must assist in:

- a) Splinting (plaster slab) for the purpose of emergency splintage, definitive splintage and post-operative splintage and application of Thomas splint,
- b) Manual reduction of common fractures – phalangeal, metacarpal, metatarsal and Colles' fracture,
- c) Manual reduction of common dislocations – interphalangeal, metacarpophalangeal, elbow and shoulder dislocations,
- d) Plaster cast application for undisplaced fractures of arm, fore arm, leg and ankle,
- e) Emergency care of a multiple injury patient,
- f) Transport and bed care of spinal cord injury patients.

(B) Skill that an intern should be able to perform under supervision:

- a) Advise about prognosis of poliomyelitis, cerebral palsy, CTEV and CDH,
- b) Advise about rehabilitation of amputees and mutilating traumatic and leprosy deformities of hand.

(C) An intern must have observed or preferably assisted at the following operations:

- a) Drainage for acute osteomyelitis,
- b) Sequestrectomy in chronic osteomyelitis,
- c) Application of external fixation,
- d) Internal fixation of fractures of long bones.

12.6.10 DERMATOLOGY VENEREOLOGY & LEPROSY**GOAL:**

The aim of teaching the undergraduate student in Dermatology Venereology & Leprosy is to impart such knowledge and skills that may enable him to diagnose and treat common dermatological infections and leprosy. He/she shall acquire competence for clinical diagnosis based on history, physical examination and relevant laboratory investigations and institute appropriate line of management; this would include diseases common in tropics (parasitic, bacterial or viral infections, and cutaneous manifestations of systemic illnesses).

A. THERAPEUTIC- At the end of internship an intern must be able to:

- a) Conduct proper clinical examination; elicit and interpret physical findings, and diagnose common disorders and emergencies,

- b) Perform simple, routine investigative procedures for making bedside diagnosis, specially the examination of scraping for fungus, preparation of slit smears and staining for AFB for leprosy patient and for STD cases,
- c) Manage common diseases recognizing the need for referral for specialized care in case of inappropriateness of therapeutic response.

B. An intern must have observed or preferably assisted at the following operations/ procedures:

- a) Skin biopsy for diagnostic purpose

12.6.11 PSYCHIATRY

GOAL:

The aim of teaching the undergraduate student in Psychiatry is to impart such knowledge and skills that may enable him to diagnose and treat common psychiatric illnesses. He/she shall acquire competence for clinical diagnosis based on history, physical examination and relevant laboratory investigations and institute appropriate line of management. He/she should also be able to recognize the behavioural manifestations of systemic illnesses.

A. THERAPEUTIC- An intern must perform or assist in:

- a) Diagnose and manage common psychiatric disorders,
- b) Identify and manage psychological reactions,
- c) Diagnose and manage behavioural disorders in medical and surgical patients.

B. An intern must have observed or preferably assisted at the following operations/ procedures:

- a) ECT administration,
- b) Therapeutic counseling and follow-up.

12.6.12 RESPIRATORY MEDICINE

GOAL:

The aim of teaching the undergraduate student in Respiratory Medicine is to impart such knowledge and skills that may enable him to diagnose and treat common respiratory illnesses. He/she shall acquire competence for clinical diagnosis based on history, physical examination and relevant laboratory investigations and institute appropriate line of management.

A. THERAPEUTIC - An intern must perform or assist in:

- a) diagnosing and managing common respiratory disorders and emergencies,
- b) simple, routine investigative procedures required for making bed side diagnosis, especially sputum collection, examination for etiological organism like AFB, interpretation of chest X-rays and respiratory function tests,
- c) interpreting and managing various blood gases and pH abnormalities in various illnesses.

B. An intern must have observed or preferably assisted at the following operations/ procedures:

- a) Laryngoscopy,
- b) Pleural aspiration, respiratory physiotherapy, laryngeal intubation and pneumo-thoracic drainage aspiration,
- c) Therapeutic counseling and follow up.

12.6.13 ANAESTHESIOLOGY

GOAL:

The aim of teaching the undergraduate student in anaesthesia is to impart such knowledge and skills that may enable him to understand principles of anaesthesia and recognize risk and complications of anaesthesia. At the end of internship, graduate should be able to perform cardio-pulmonary resuscitation correctly, including recognition of cardiac arrest.

(A) THERAPEUTIC- An intern must perform or assist in:

- a) Pre-anaesthetic checkup and prescribe pre-anaesthetic medications,

- b) Venepuncture and set up intravenous drip,
- c) Laryngoscopy and endotracheal intubation,
- d) Lumbar puncture, spinal anaesthesia and simple nerve blocks,
- e) Simple general anaesthetic procedures under supervision,
- f) Monitor patients during anaesthesia and in the post-operative period,
- g) Maintain anaesthetic records,
- h) Perform cardio-pulmonary resuscitation correctly, including recognition of cardiac arrest.

(B) Skill that an intern should be able to perform under supervision:

- a) Counseling and advise regarding various methods of anaesthesia,
- b) Recognise and manage problems associated with emergency anaesthesia,
- c) Recognise and treat complications in the post-operative period.

(C) An intern must have observed or preferably assisted at the following operations/ procedures:

- a) Anaesthesia for major and minor surgical and other procedures;

12.6.14 RADIODIAGNOSIS

GOAL:

The aim of teaching the undergraduate student in radiodiagnosis is to impart such knowledge and skills that may enable him to understand principles of imageology and recognize risk and complications of radiologic procedures and the need for protective techniques. At the end of internship, graduate should be able to counsel and prepare patients for various radiologic procedures.

An intern must acquire competency in:

- a) Identifying and diagnosing acute abdominal conditions clinically and choose appropriate imaging modality for diagnosis,
- b) Identifying and diagnosing acute traumatic conditions in bones and skull using X rays / CT Scans with emphasis on fractures and head injuries,
- c) Recognising basic hazards and precautions in radio-diagnostic practices specially related to pregnancy,
- d) Demonstrating awareness of the various laws like PC PNDT Act.

12.6.15 PHYSICAL MEDICINE AND REHABILITATION

GOAL:

The aim of teaching the undergraduate student in Physical Medicine & Rehabilitation is to impart such knowledge and skills that may enable him to diagnose and treat common rheumatologic, orthopedic and neurologic illnesses requiring physical treatment. He/she shall acquire competence for clinical diagnosis based on history, physical examination and relevant laboratory investigations and institute appropriate line of management.

A. THERAPEUTIC- An intern must perform or assist in:

- a) Diagnosing and managing with competence clinical diagnosis and management based on detailed history and assessment of common disabling conditions like poliomyelitis, cerebral palsy, hemiplegia, paraplegia, amputations etc.
- b) Participation as a team member in total rehabilitation including appropriate follow up of common disabling conditions,
- c) Procedures of fabrication and repair of artificial limbs and appliances.

B. An intern must have observed or preferably assisted at the following operations/ procedures:

- a) use of self-help devices and splints and mobility aids
- b) accessibility problems and home making for disabled
- c) simple exercise therapy in common conditions like prevention of deformity in polio, stump exercise in an amputee etc.
- d) Therapeutic counselling and follow up

12.6.16 FORENSIC MEDICINE AND TOXICOLOGY**GOAL:**

The aim of teaching the undergraduate student in Forensic Medicine is to impart such knowledge and skills that may enable him to manage common medico-legal problems in day to day practice. He/she shall acquire competence for post mortem diagnosis based on history, physical examination and relevant observations during autopsy.

A. An intern must perform or assist in:

- a) Identifying and documenting medico-legal problems in a hospital and general practice,
- b) Identifying the medico-legal responsibilities of a medical man in various hospital situations,
- c) Diagnosing and managing with competence basic poisoning conditions in the community,
- d) Diagnosing and managing with competence and documentation in cases of sexual assault,
- e) Preparing medico-legal reports in various medico legal situations.

B. An intern must have observed or preferably assisted at the following operations/ procedures, as given in Table 11:

- a) Various medico legal / post-mortem procedures and formalities during their performance by police.

Table 11: Certifiable Procedural Skills:

A Comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) – Indian Medical Graduate

Specialty	Procedure
General Medicine	<ul style="list-style-type: none"> • Venipuncture (I) • Intramuscular injection(I) • Intradermal injection (D) • Subcutaneous injection(I) • Intra Venous (IV) injection (I) • Setting up IV infusion and calculating drip rate (I) • Blood transfusion (O) • Urinary catheterization (D) • Basic life support (D) • Oxygen therapy (I) • Aerosol therapy / nebulization (I) • Ryle's tube insertion (D) • Lumbar puncture (O) • Pleural and ascitic aspiration (O) • Cardiac resuscitation (D) • Peripheral blood smear interpretation (I) • Bedside urine analysis (D)
General Surgery	<ul style="list-style-type: none"> • Basic suturing (I) • Basic wound care (I)

	<ul style="list-style-type: none"> • Basic bandaging (I) • Incision and drainage of superficial abscess (I) • Early management of trauma (I) and trauma life support (D)
Orthopedics	<ul style="list-style-type: none"> • Application of basic splints and slings (I) • Basic fracture and dislocation management (O) • Compression bandage (I)
Gynecology	<ul style="list-style-type: none"> • Per Speculum (PS) and Per Vaginal (PV) examination (I) • Visual Inspection of Cervix with Acetic Acid (VIA) (O) • Pap Smear sample collection & interpretation (I) • Intra- Uterine Contraceptive Device (IUCD) insertion & removal (I)
Obstetrics	<ul style="list-style-type: none"> • Obstetric examination (I) • Episiotomy (I) • Normal labor and delivery (including partogram) (I)
Pediatrics	<ul style="list-style-type: none"> • Neonatal resuscitation (D) • Setting up Pediatric IV infusion and calculating drip rate (I) • Setting up Pediatric Intraosseous line (O)
Forensic Medicine	<ul style="list-style-type: none"> • Documentation and certification of trauma (I) • Diagnosis and certification of death (D) • Legal documentation related to emergency cases (D) • Certification of medical-legal cases e.g. Age estimation, sexual assault etc. (D) • Establishing communication in medico-legal cases with police, public health authorities, other concerned departments, etc (D)
Otorhinolaryngology	<ul style="list-style-type: none"> • Anterior nasal packing (D) • Otoscopy (I)
Ophthalmology	<ul style="list-style-type: none"> • Visual acuity testing (I) • Digital tonometry (D) • Indirect ophthalmoscopy (O) • Epilation (O) • Eye irrigation (I) • Instillation of eye medication (I) • Ocular bandaging (I)
Dermatology	<ul style="list-style-type: none"> • Slit skin smear for leprosy (O) • Skin biopsy (O) • Gram's stained smear interpretation(I) • KOH examination of scrapings for fungus (D) • Dark ground illumination (O) • Tissue smear (O) • Cautery - Chemical and electrical (O)

- I- Independently performed on patients,
- O- Observed in patients or on simulations,
- D- Demonstration on patients or simulations and performance under supervision in patients

Certification of Skills: Any faculty member of concerned department can certify skills. For common procedures, the certifying faculty may be decided locally.

[ADVT.-III/4/Exty./277/19]

Dr. R. K. VATS, Secy. General

Foot Note: The Principal Regulations namely, “Graduate Medical Education Regulations, 1997” were published in Part – III, Section (4) of the Gazette of India vide Medical Council of India notification dated 4th March, 1997, and amended vide MCI notifications dated 29/05/1999, 02/07/2002, 30/09/2003, 16/10/2003, 01/03/2004, 20/10/2008, 15/12/2008, 22/12/2008, 25/03/2009, 19/04/2010, 07/10/2010, 21/12/2010, 15/02/2012, 29/12/2015, 05/08/2016, 21/09/2016, 10/03/2017, 04/07/2017, 23/01/2018, 06/02/2018, 21/05/2018, 05/02/2019 & 14/05/2019.



CISP

**Curriculum Implementation Support
Program of the Competency Based
Undergraduate Medical Education
Curriculum**

2019



**Medical Council of India
Pocket-14, Sector-8, Dwarka,
New Delhi 110 077**

Introduction

The Medical Council of India has revised the undergraduate medical education curriculum so that the Indian Medical Graduate is able to recognize "health for all" as a national goal and should be able to fulfill his/her societal obligations. The revised curriculum has attempted to enunciate the competencies the student must be imparted and should have learnt, with clearly defined teaching-learning strategies and effective methods of assessment. Communicating effectively and sympathetically with patients and their relatives has been visualized as a core area of the revised curriculum. These and other goals identified in the curriculum are to be implemented in all medical colleges under the ambit of Medical Council of India from August 2019 and to smoothen this process Guidelines have been prepared for its effective implementation. In response to the need for a seamless introduction of the curriculum into the Undergraduate system, all medical colleges need to upgrade the teaching-learning skills of their faculty. Earlier experience with implementation of curricular changes suggests that a carefully managed, sustainable approach is necessary to ensure that every college has access to the new skills and knowledge enunciated in the new curriculum. Faculty training and development thus assumes a key role in the effective implementation and sustenance of the envisaged curricular reforms.

Though **Medical Council of India has provided broad framework**, it is not possible to bring complete uniformity in a vast country like India. Hence, local authorities such as Universities, Colleges and faculty need to make appropriate refinements at local level to suit their local needs keeping the broad framework intact. The program needs to be implemented by all stakeholders and shall be facilitated by Universities, Nodal and Regional centers along with Curriculum Committees in all colleges.

State Health Universities and other Universities shall develop appropriate assessment plan along the directions and principles mentioned in the curriculum documents, as assessment is mainly a University prerogative. They can use a variety of established methods of assessment that would test competency and make choices as per feasibility and available expertise. Academic Councils along with Board of Studies should revamp the assessment plans to achieve goals and objectives of the revised UG Curriculum.

MCI has already issued directions that Dean/ Principal of medical College should constitute a “ **Curriculum committee**” with following representation:

- a) One Professor/ Associate Professor from Medicine & allied disciplines
- b) One Professor/ Associate Professor from Surgery & allied disciplines
- c) One Professor/ Associate Professor from Para-clinical disciplines

- d) One Professor/ Associate Professor from Pre-clinical disciplines
- e) MEU coordinator of the college
- f) Student/Intern representative
- g) Dean: Chairman of Committee

The Curriculum Committee members (a to e) require to undergo the Faculty Development Programme of the Council, imparted through its network of Nodal and Regional Centres.

Curriculum Committees along with Medical Education Units/ Departments would help colleges to implement the new UG curriculum including the AETCOM (Attitude, Ethics & Communication) program. Each college should develop the framework for the Foundation Course. The Foundation course which will be of 1-month duration after admission, aims to orient the students to national health scenarios, medical ethics, health economics, learning skills & communication, Basic Life Support, computer learning, sociology & demographics, biohazard safety, environmental issues and community orientation. Foundation course may also include 1) Orientation program 2) language and computer skills 3) communication skills and 4) time management skills and 5) Professional development program highlighting ethical and humanities issues. Each College should select elements of Foundation course as per local needs and develop faculty expertise from initial years. However, experts and other teachers may be invited as per need. It is emphasized that interactive case scenarios, movies, videos, and small group discussions may be used for each concept along with the principles of reflective learning.

The Curriculum Committee will be responsible for developing the curricular modules and their implementation at their institution.

The Curriculum implementation Support Program (CISP) developed by the Expert Group constituted by the Medical Council of India, provides the much needed intellectual support to colleges for smooth transition from existing to the new curriculum. The key players in CISP are the faculty of the Medical Education Department of Regional centers and Nodal centers to which all colleges are attached. Four of the many new key areas recommended in the Vision 2015, were identified for implementation across the entire duration of the course at Phase I. The areas identified were such that they would be helpful to initiate the process of curricular reforms from first year of the undergraduate course. These areas are Foundation course, Early Clinical Exposure, Integrated teaching & Learning & Skill development & training.

- a) **Foundation Course:** This is a one month to orient medical learners to MBBS program and provide them with requisite knowledge, communication (including electronic), technical and language skills.

- b) **Early clinical exposure:** The clinical training would start in the first year, focusing on communication, basic clinical skills and professionalism. There would be sufficient clinical exposure at the primary care level and this would be integrated with the learning of basic and laboratory sciences. Introduction of case scenarios for classroom discussion/case-based learning would be emphasized. It will be done as a coordinated effort by the pre-clinical, para-clinical and clinical faculty.
- c) **Integrated teaching and learning :** The innovative new curriculum has been structured to facilitate horizontal and vertical integration between and among disciplines, bridge the gaps between theory & practice, between hospital based medicine and community medicine. Basic and laboratory sciences (integrated with their clinical relevance) would be maximum in the first year and will progressively decrease in the second and third year of the training when clinical exposure and learning would be dominant.
- d) **Skill development and learning (throughout curriculum):** A mandatory & desirable comprehensive list of skills has been planned and would be recommended for the Indian Medical Graduate. Certification of skills would be necessary before licensure.
- e) **Electives:** The aim of adding electives is to allow flexible learning options in the curriculum and may offer a variety of options including clinical electives, laboratory postings or community exposure in areas that students are not normally exposed as a part of regular curriculum. This will also provide opportunity for students to do a project, enhance self-directed learning, critical thinking and research abilities.

Examples:- Bio-Informatics, Tissue Culture, Tissue Engineering/Processing, Computer and Computer applications, Immunology, Genetics, Human Nutrition, Sports Medicine, Laboratory Sciences, Research Methodology, Ethics, Accident and Emergencies (A&E), Community Projects, HIV Medicine, Pharmacokinetics/Pharmacodynamics/Pharmacoeconomics, Assisted Reproductive Technology, Ethics & Medical Education.

All Nodal centers and Regional centers will conduct CISP workshops for all faculty assigned to their Centres, in the above mentioned areas.

1. All Nodal and Regional Centres (NC/RC) will conduct workshop/s for all MEU Unit coordinators and Curriculum Committee members of the colleges under their charge for Faculty Development program (FDP), before March 2019. This workshop should be of similar nature and convey the theme along with these concepts to all ME Unit coordinators. MEU coordinators should conduct local workshop for first Phase

teachers and few senior teachers from other phases to initiate implementation of new curriculum.

2. All NCs/RCs would also conduct a workshop for their respective medical school teachers prior to the workshop for ME Unit coordinators workshop. This will be an in-house workshop.
3. All Teaching-Learning materials may be refined and uploaded on website for wider access.
4. Basic skill labs to be made mandatory requirement in all medical colleges. This must be made a part of the Minimum Standard Requirements for a college.

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PREAMBLE

The undergraduate medical curriculum of the medical council of India is created to ensure that the medical doctor who emerges from the MBBS training program is capable of assisting the nation to achieve its goal of health for all. In addition, it aspires to ensure that the “graduate” meets or exceeds global bench-mark in knowledge, attitude, skills and communication. This intent is at the core of the Graduate Medical Regulations, 2019.

The Graduate Medical Regulations, 2019 represents the first major revision to the medical curriculum since 1997 and hence incorporates changes in science and thought over two decades. A significant advance is the development of global competencies and subject-wise outcomes that define the roles of the “Indian Medical Graduate”. Learning and assessment strategies have been outlined that will allow the learner to achieve these competencies/outcomes. Effective appropriate and empathetic communication, skill acquisition, student-doctor method of learning, aligned and integrated learning and assessment are features that have been given additional emphasis in the revised curriculum.

The revised curriculum is to be implemented by all medical colleges under the ambit of Medical Council of India from August 2019. The roll out will be progressive over the duration of the MBBS course.

Since the curriculum requires significant change in planning, delivery and assessment, the Council has created a governance and support structure that would help institutions, teachers and students navigate the change successfully. Capacity building in the form of basic and advanced support for faculty is an ongoing activity of the Medical Council of India. The structural framework of support includes the Medical Education Unit or the Medical Education Department of the institutions and the Nodal and Regional Centers of the Medical Council of India. To these, the MCI has added the governance oversight of the curriculum in the form of the Curriculum Committee at the institutional level.

As part of the roadmap to the curricular roll out - a nationwide Curriculum Implementation Support Program is being cascaded in a ‘train the trainer’ format. The program will be supported by learning resource material, workshops, videos online support etc. A carefully designed quality and oversight program will ensure monitoring of the curricular implementation and required course corrections.

The change requires extensive stakeholder commitment and involvement. These include commitment for the curricular change at the leadership level in institutions, investment in infrastructure, oversight and training programs and technology that will facilitate smooth delivery and evaluation of the curriculum. Faculty would be required

to unlearn, re-learn, adapt and innovate. The role of the University in adopting and embracing the change and aligning assessment along the lines suggested in the Graduate Medical Education Regulations (GMR) document are critical to achieving the objectives of the curricular change. At a student level, the curriculum requires greater commitment, shared responsibility, self directed and ongoing learning.

This document represents a compilation of the resource material that will be used in the Curricular Implementation Support Program (CISP) and has attempted to provide a stepwise and comprehensive approach to implement the curriculum. It details the philosophy and the steps required in a simple and richly illustrated manner. Teaching slide decks, faculty guides and online resource material supplement this document. The document is to be used in conjunction with the Competency document, AETCOM module and the GMR document.

The timelines and measurables for the new curriculum are outlined in the chapter on curricular governance. The Expert Group for curricular implementation would like to place on record the tremendous contribution by subject experts, the Reconciliation Board, the Academic Cell of the MCI, the faculty, administration, Medical Education Units and leaders of each medical college, the Nodal and Regional Centers, and the Universities who have all helped to create the right environment for change. The Board of Governors of MCI are the pivot who have led from the front and facilitated this important national need in a very short time duration and deserve the praise and gratitude of the medical fraternity.

Contents

Learning Resource Materials

SI No	Topic	Page
1	Salient features of Graduate Medical Education Regulations	11
2	Principles of CBME	21
3	Alignment and Integration	36
4	Electives	48
5	Early Clinical Exposure	54
6	Principles of Competency Based Assessment	58
7	Skill Training & Assessment	65
8	Curricular Governance	79
9	Foundation Course	86
10	AETCOM	94
11	Humanities	102
12	Addendum to Graduate Medical Education Regulations	
13	Example for Alignment and Integration	

LEARNING RESOURCE MATERIALS

Salient features of Graduate Medical Education Regulations, 2019

Overview

The new Graduate Medical Education Regulations, 2019 attempts to stand on the shoulder of the contributions and the efforts of resource persons, teachers and students past and present attempts to take the learner to provide healthcare to the evolving needs of the nation and the world.

More than twenty years have passed since the existing Regulations on Graduate Medical Education, 1997 was notified necessitating a relook at all aspects of the various components in the current regulations and adapt them to the changing demography, socio-economic context, perceptions, values and expectations of stakeholder, emerging health care issues particularly in the context of newly emerging diseases, impact of advances in science and technology, shorter distances on diseases and their management, The strong and forward looking fundamentals enshrined in the Graduate Medical Education Regulations, 1997 has made this job easier. A comparison between the 1997 Regulations and proposed Regulations on Graduate Medical Education, 2019 (GMR) will reveal that the 2019 Regulations have evolved from several key principles enshrined in the 1997 Regulations.

The thrust in the new Regulations is continuation and evolution of thought in medical education making it more learner-centric, patient-centric, gender-sensitive, outcome oriented and environment appropriate. The result is a competency based curriculum which conforms to global trends. Emphasis is made on alignment and integration of subjects both horizontally and vertically while respecting the strengths and necessity of subject-based instruction and assessment.

A significant attempt has been made in the competency based undergraduate curriculum to provide the orientation and the skills necessary for life-long care of the patient. In particular, the curriculum provides for early clinical exposure, electives and longitudinal care. Skill acquisition is an indispensable component of the learning process in medicine. The curriculum reinforces this aspect by necessitating certification of certain essential skills. The experts and the writing group have factored in patient availability, access, consent, number of students in a class etc in suggesting skill acquisition and assessment methods; the use of skills labs, simulated and guided environments are encouraged.

The importance of ethical values, responsiveness to the needs of the patient and acquisition of communication skills is underscored by providing dedicated curriculum time in the form of a longitudinal program called Attitude, Ethics and Communication (AETCOM) competencies. Greater emphasis has been placed on collaborative and interdisciplinary teamwork, professionalism, altruism and respect in professional

relationships with due sensitivity to differences in thought, social and economic position and gender.

In addition to the above an attempt has been made to allow students from diverse educational streams and backgrounds to transition appropriately through a foundation program. Dedicated time has been allotted for self directed learning and co curricular activity.

Formative and internal assessment has been streamlined to achieve the objectives of the curriculum. Minor tweaks to the summative assessment have been made to reflect evolving thought and regulatory requirements. Curricular governance and support have been strengthened.

The curriculum document in conjunction with the new Graduate Medical Education Regulations, when notified, must be seen as a “living document” that should evolve as stakeholder requirements and aspirations change.

Key components of GMR, 2019 are summarised below. The time distribution according to phases is summarised in figure 1 later.

1. Concept of the Indian Medical Graduate as an achievable goal
2. Roles that define the Indian Medical Graduate
3. Definition of Global competencies for each role envisaged
4. Defined subject-based outcomes that can be mapped to the global competencies
5. Alignment of instruction with reasonable integration
6. Greater emphasis on learner centric instruction
7. Greater emphasis on learning in primary and secondary care environments
8. Student Doctor Method of Clinical Training
9. Emphasis on skill acquisition and certification
10. Early Clinical Exposure
11. Longitudinal program on attitude ethics and communication
12. Foundation course
13. Shared responsibility and self directed learning
14. Electives
15. Time for sport and extracurricular activities
16. Assessment changes

Concept of the Indian Medical Graduate as an achievable goal

The undergraduate medical education program is designed with a goal to create an “Indian Medical Graduate” (IMG) possessing requisite knowledge, skills, attitudes, values and responsiveness, so that he or she may function appropriately and effectively as a physician of first contact of the community while being globally relevant.

Defined Roles of the Indian Medical Graduate

The GMR envisages the following roles that a graduate must perform in-order to achieve the goal of the UG medical education program

Clinician: who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.

Leader and member of the healthcare team and system: with capabilities to collect analyze, synthesize and communicate health data appropriately.

Communicator: with patients, families, colleagues and community.

Lifelong learner: committed to continuous improvement of skills and knowledge.

Professional: who is committed to excellence, is ethical, responsive and accountable to patients, community and profession.

Global Competencies mapped to each role:

Statement of achievement of defined measurable outcomes have been spelt out for each role - these are called global competencies and are summarised in GMR, 2019 document.

Defined subject based outcomes that can be mapped to the global competencies

The GMR, 2019 proposes continuance with subject based instruction. To reconcile subject based instruction with transition to competency based education - subject based outcomes (so called sub-competencies) have been derived by subject experts and compiled. Guidance on the domain, level of mastery required, suggested learning and assessment methods, requirement of certification, recommended integration etc have been provided in a three volume stand alone document. This document can be accessed at <https://old.mciindia.org/InformationDesk/ForColleges/UGCurriculum.aspx>

Alignment of instruction with reasonable integration

To the extent possible the GMR, 2019 stresses the importance of temporal coordination of related topics in each phase - this is called alignment. Integration within the phase (horizontal integration) and with other phases have been provided for - this is explained in greater length in this document.

Learner centered instruction

The GMR, 2019 lays great emphasis on learner centric methods of instruction. Time has been apportioned for small group learning, interactive and case based learning,

collaborative and team based learning. Didactic learning time has been reduced to less than a third of the allotted time in each subject.

Learning in primary and secondary care environments

The GMR, 2019 has provisions for learning in both primary and secondary care settings such as Taluk hospitals and Urban Health Care Centres. Learning will have a strong prevention and primary care focus with particular emphasis on national and regional health care priorities and programs.

Student - Doctor Method of Clinical Training

The student - doctor method of clinical training provides for the student to function as a member of the clinical care team, work with patients and follow them longitudinally. The program allows for students to care for patients in a supervised manner taking part in admission day activities, following patients during the course of hospitalisation, writing and maintaining case records and participating, observing and assisting in procedures in a graded fashion. The student doctor method of training will commence in the second clinical posting

Skill Acquisition and Certification

The ability of students to be able to acquire and practice important skills in a safe and supervised environment is given importance. Institutions are mandated to create skills labs in which skill acquisition is possible. A list of certifiable skills that the learner has to acquire prior to graduation has been developed. Protected skill acquisition time for basic skills has also been appropriated in the timetable.

Early Clinical Exposure (ECE)

Providing a clinical context and ensuring patient centricity of instructions are the key principles underlying early clinical exposure. The ECE provides for three key elements - basic science correlation, clinical skills including authentic patient contact and an introduction to humanities in medicine. ECE is expanded further in this document.

Attitude Ethics and Communication

AETCOM (Attitude Ethics and Communication) is a longitudinal modular program that provides for instruction in professionalism, bioethics and communication skills. Dedicated time has been carved out for AETCOM instruction in all the phases. The program has already been rolled out by the MCI.

Foundation Course

The Foundation Course is aimed at providing an introduction to the MBBS program that will allow students from diverse backgrounds languages and varying degrees of technical and communication skills to adapt and enhance required skills. There is a provision for

continued longitudinal instruction in language and computer skills following the one month program.

Self Directed Learning

The GMR, 2019 encourages shared responsibility in learning with emphasis on knowledge and skill acquisition, assignment and task completion, living experiences, reflection and self directed learning. Dedicated time for self directed learning is provided in each subject in every phase.

Electives

Electives provide opportunities for students to acquire diverse learning experiences. Two, four week blocks of elective time, has been created to allow students to a) rotate in a pre- or a para - clinical / work under the supervision of a researcher, and b) rotate in a pre-specified specialty / work in a rural or urban community clinic under supervision.

Sports and Extracurricular activity

Protected time for sports and extracurricular activity has been carved into the curriculum to allow students to preserve work life balance and prevent burn out.

Assessment changes

Some key changes in areas of assessment have been proposed in the GMR, 2019. A pass score in the theory AND practical/ clinical parts of the Internal Assessment will be a prerequisite to attempt the summative examination. Formative assessment is streamlined. Continuous assessment through log books, documentation reports etc are given additional importance. Internal Assessment will not contribute to the summative examination. Separate pass in theory and practical / clinical is required. Viva marks will be added to practical/ clinical examination. A provision for skill assessment and assessment of AETCOM competencies has also been made.

Figure 1: Time distribution of MBBS program & Examination Schedule

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							Foundation Course	I MBBS			
I MBBS								I yr exam	II MBBS		
II MBBS								II yr exam	III MBBS Part 1		
III MBBS Part I									Part 1 exam	Electives and skills	
III MBBS Part II											
Part II exam	Internship										

1. Short Title and Commencement

The undergraduate medical education program is designed with a **goal** to create an **“Indian Medical Graduate” (IMG)** possessing requisite knowledge, skills, attitudes, values and responsiveness, so that he or she may function appropriately and effectively *as a physician of first contact of the community* while being globally relevant.

2. Objectives

2.3. Goals and Roles for the Learner

In order to fulfil the goal of the IMG training programme, the medical graduate must be able to function in the following roles appropriately and effectively:-

- 2.3.1. Clinician who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.

- 2.3.2. Leader and member of the health care team and system with capabilities to collect analyze, synthesize and communicate health data appropriately.
- 2.3.3. Communicator with patients, families, colleagues and community.
- 2.3.4. Lifelong learner committed to continuous improvement of skills and knowledge.
- 2.3.5. Professional, who is committed to excellence, is ethical, responsive and accountable to patients, community and profession.

3. Competency Based Training Programme of the Indian Medical Graduate

Competency based learning would include designing and implementing medical education curriculum that focuses on the desired and observable ability in real life situations. In order to effectively fulfil the roles as listed in clause 2, the Indian Medical Graduate would have obtained the following set of competencies at the time of graduation:

3.1. *Clinician, who understands and provides preventive, promotive, curative, palliative and holistic care with compassion*

- 3.1.1 Demonstrate knowledge of normal human structure, function and development from a molecular, cellular, biologic, clinical, behavioural and social perspective.
- 3.1.2. Demonstrate knowledge of abnormal human structure, function and development from a molecular, cellular, biological, clinical, behavioural and social perspective.
- 3.1.3 Demonstrate knowledge of medico-legal, societal, ethical and humanitarian principles that influence health care.
- 3.1.4 Demonstrate knowledge of national and regional health care policies including the National Health Mission that incorporates National Rural Health Mission (NRHM) and National Urban Health Mission (NUHM), frameworks, economics and systems that influence health promotion, health care delivery, disease prevention, effectiveness, responsiveness, quality and patient safety.
- 3.1.5. Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is complete and relevant to disease identification, disease prevention and health promotion.
- 3.1.6. Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is contextual to gender, age, vulnerability, social and economic status, patient preferences, beliefs and values.
- 3.1.7 Demonstrate ability to perform a physical examination that is complete and relevant to disease identification, disease prevention and health promotion.

- 3.1.8 Demonstrate ability to perform a physical examination that is contextual to gender, social and economic status, patient preferences and values.
- 3.1.9 Demonstrate effective clinical problem solving, judgment and ability to interpret and integrate available data in order to address patient problems, generate differential diagnoses and develop individualized management plans that include preventive, promotive and therapeutic goals.
- 3.1.10 Maintain accurate, clear and appropriate record of the patient in conformation with legal and administrative frame works.
- 3.1.11 Demonstrate ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context.
- 3.1.12 Demonstrate ability to prescribe and safely administer appropriate therapies including nutritional interventions, pharmacotherapy and interventions based on the principles of rational drug therapy, scientific validity, evidence and cost that conform to established national and regional health programmes and policies for the following:
 - i) Disease prevention,
 - ii) Health promotion and cure,
 - iii) Pain and distress alleviation, and
 - iv) Rehabilitation
- 3.1.13 Demonstrate ability to provide a continuum of care at the primary and/or secondary level that addresses chronicity, mental and physical disability.
- 3.1.14 Demonstrate ability to appropriately identify and refer patients who may require specialized or advanced tertiary care.
- 3.1.15 Demonstrate familiarity with basic, clinical and translational research as it applies to the care of the patient.

3.2. ***Leader and member of the health care team and system***

- 3.2.1 Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals.
- 3.2.2 Recognize and function effectively, responsibly and appropriately as a health care team leader in primary and secondary health care settings.
- 3.2.3 Educate and motivate other members of the team and work in a collaborative and collegial fashion that will help maximize the health care delivery potential of the team.
- 3.2.4 Access and utilize components of the health care system and health delivery in a manner that is appropriate, cost effective, fair and in compliance with

the national health care priorities and policies, as well as be able to collect, analyze and utilize health data.

3.2.5 Participate appropriately and effectively in measures that will advance quality of health care and patient safety within the health care system.

3.2.6 Recognize and advocate health promotion, disease prevention and health care quality improvement through prevention and early recognition: in a) life style diseases and b) cancers, in collaboration with other members of the health care team.

3.3. ***Communicator with patients, families, colleagues and community***

3.3.1 Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.

3.3.2 Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and trustworthy.

3.3.3 Demonstrate ability to communicate with patients in a manner respectful of patient's preferences, values, prior experience, beliefs, confidentiality and privacy.

3.3.4 Demonstrate ability to communicate with patients, colleagues and families in a manner that encourages participation and shared decision-making.

3.4. ***Lifelong learner committed to continuous improvement of skills and knowledge***

3.4.1. Demonstrate ability to perform an objective self-assessment of knowledge and skills, continue learning, refine existing skills and acquire new skills.

3.4.2. Demonstrate ability to apply newly gained knowledge or skills to the care of the patient.

3.4.3. Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.

3.4.4. Demonstrate ability to search (including through electronic means), and critically evaluate the medical literature and apply the information in the care of the patient.

3.4.5. Be able to identify and select an appropriate career pathway that is professionally rewarding and personally fulfilling.

3.5. ***Professional who is committed to excellence, is ethical, responsive and accountable to patients, community and the profession***

3.5.1. Practice selflessness, integrity, responsibility, accountability and respect.

3.5.2. Respect and maintain professional boundaries between patients, colleagues and society.

- 3.5.3. Demonstrate ability to recognize and manage ethical and professional conflicts.
- 3.5.4. Abide by prescribed ethical and legal codes of conduct and practice.
- 3.5.5. Demonstrate a commitment to the growth of the medical profession as a whole.

Principles of CBME

Aligning Competencies to Learning

Objectives of the session

At the end of this session, the learner will be able to facilitate institute faculty to derive learning sessions as envisaged in the GMR and competency documents of the MCI

Glossary of terms used

A **competency** is an observable ability of a learner that includes multiple components including knowledge skills values and attitude.

An **objective** is a statement of what a learner should be able to do at the end of a specific learning session (or experience).

Core: A competency that is necessary in order to complete the requirements of the subject (traditional must know).

None Core: A competency that is optional in order to complete the requirements of the subject (traditional nice (good) to know/ desirable to know).

Lecture: Any instructional large group method including traditional lecture and interactive lecture.

Small Group Discussion: Any instructional method involving small groups of students in an appropriate learning context.

Skill Assessment: A session that assesses the skill of the student including those in the practical laboratory, skills lab, skills station that uses mannequins/ paper case/simulated patients/real patients as the context demands.

DOAP (Demonstrate Observe Assist Perform Session) A practical session that allows the student to observe a demonstration, assist the performer, perform (demonstrate) in a simulated environment, perform under supervision or perform independently.

Relevant Extract from GMR, 2019

4. Broad Outline on training format

4.1.3 Teaching-learning methods shall be student centric and shall predominantly include small group learning, interactive teaching methods and case based learning.

- 4.1.4 Clinical training shall emphasize early clinical exposure, skill acquisition, certification in essential skills; community/primary/secondary care based learning experiences and emergencies.
- 4.1.5 Training shall primarily focus on preventive and community based approaches to health and disease, with specific emphasis on national health priorities such as family welfare, communicable and non-communicable diseases including cancer, epidemics and disaster management.
- 4.1.6 Acquisition and certification of skills shall be through experiences in patient care, diagnostic and skill laboratories.
- 4.1.7 The development of ethical values and overall professional growth as integral part of curriculum shall be emphasized through a structured longitudinal and dedicated programme on professional development and ethics.
- 7.5 Didactic lectures shall not exceed one third of the schedule; two third of the schedule shall include interactive sessions, practicals, clinical or/and group discussions. The learning process should include living experiences, problem oriented approach, case studies and community health care activities.

Description in the context of the curriculum

The curriculum in GMR, 2019 is outcome (competency) driven. The transition from a syllabi-driven curriculum (structure process) to a competency based framework necessitates several important changes in approach to the learning and assessment. These are summarised in table 1.

Table 1: Difference between CBME and Structure process (syllabus) based

	Structure / Process	Competency Based
Driving force for curriculum	Content: Knowledge acquisition	Outcome: Knowledge application
Driving force for process	Teacher	Student
Responsibility for content	Teacher	Student and teacher
Goal of educational encounter	Knowledge acquisition	Knowledge application
Typical assessment tool	Single subjective	Multiple objective
Assessment tool	Proxy	Authentic
Setting for assessment	Removed (gestalt)	Direct observation
Assessment	normative referenced	criterion referenced
Timing of assessment	Emphasis on summative	Emphasis on formative
Program completion	Fixed time	Variable time

The shift in focus from knowledge acquisition to application necessitates important changes in the learning process: These include greater emphasis on (a) shared responsibility in the learning process (b) self-directed and collaborative learning (c) use of learner centric approaches (d) skill acquisition and certification e) formative assessment as integral to the learning process (f) progressive increase in the complexity of learning (the so called ascendancy in competencies).

A careful review of the competency table is invaluable in helping derive learning sessions (figure 1):

Understanding the competencies table (Figure 1)

Understanding the competencies table

1	2	3	4	5	6	7	8	9	10
No.	Competencies	Domain	K/KH/SH/P	Core	Suggested Teaching Learning method	Suggested Assessment method	No req to certify P	Vertical Integration	Horizontal integration
Physiology									
Summary Name of Topic: General Physiology Number of competencies: (08) Number of procedures that require certification: Nil									
PY1.1	Describe the structure and functions of a mammalian cell.	K	KH	Y	Lectures, Small group discussion	Written/viva			Biochemistry
GM25.4	Elicit document and present a medical history that helps delineate the	S	SH	Y	bed side clinic, DOAP	Skill assessment		Community Medicine	

Unique number of the competency
First two alphabets represent the subject (see list)
Number following alphabet reflects topic
Number following period is a running number

Description of competency

Identifies the domain or domains addressed
K - Knowledge
S - Skill
A - Attitude
C - Communication

Identifies if the competency is core or desirable.
Y indicates Core

Identifies the suggested learning method.
DOAP - Demonstrate (by student) Observe Assist Perform

Identifies the suggested assessment method
Skill assessment - Clinics, Skills lab, Practicals etc

no of times a skill needs to be done independently to be certified for independent performance
Rarely used in UG

Subject(s) in other phases with which the competency can be vertically integrated to increase relevance or improve basic understanding

Subject(s) in the same phase with which the competency can be horizontally integrated or aligned to allow a more wholesome understanding

X

- a. Subject-wise competencies that are listed in the three volume MCI book are themselves linked to the global competencies and roles that are spelt out in the IMG document. In that sense they should be viewed as sub-competencies. It should also be pointed out that competencies generally imply end of course achievements. They are listed in phases and in subjects since we are at this time still subject based in our approach and assessment. It must be remembered that some of the components that make up the basic sciences competency can be achieved at later phases. Indeed the GMR has allocated time for teaching of pre and para-clinical competencies in phase III.

- b. The competencies themselves may be broadly divided into core and non-core - core representing the must know and tested - the non-core being desirable to know and not essential to test summatively (Table 2).

Table 2 - Core and non-Core competencies

	Core	Non- Core
Taught	Yes	Yes
% of curriculum	Not < 80%	Not > 20%
Summative assessment	Y	N
Formative assessment	Y	Y

- c. In a broad sense - competencies may be described as an amalgamation of different objectives and therefore represent objectives derived from different domains. The MCI document lists four domains - three conventional Knowledge (K) Skill (S) Attitude (A) and an additional Communication (C); this is in recognition of the importance of communication as a key domain for Indian Medical Graduate. The importance is further exemplified by the introduction of the AETCOM module.
- d. The highest levels of achievement of each competency are also specified as a continuum from Knows (K) to Knows How (KH) as knowledge attributes and Shows (S) to Shows how (SH) as skill or behavioral attributes. For the purpose of the 4 1/2 year MBBS curriculum there are very few Perform Independently skills in the competency document. In internship and post-graduation - the level of highest achievement for the same competency will change reflecting the learning continuum. Other measures such as milestones and entrustable Professional Activity (EPA) are natural additions to competency based medical education and will find greater application in the internship and post-graduation years (Table 3).

Table 3: Proficiency levels

K	Knows	A knowledge attribute – Usually enumerates or describes
KH	Knows how	A higher level of knowledge – is able to discuss or analyse
S	Shows	A skill attribute: is able to identify or demonstrate the steps
SH	Shows how	A skill attribute: is able to interpret / demonstrate a complex procedure requiring thought, knowledge and behavior
P	Performs (under supervision or independently)	Mastery for the level of competence - When done independently under supervision a pre specified number of times - certification or capacity to perform independently results

- e. In keeping with the principles of CBME a greater emphasis on acquisition of KH levels in the early phases with a shift to SH at the later phases will be evident from a review of the competency tables. It will be also evident that both acquisition of both KH and SH levels will require a shift from the traditional didactic classroom based teaching to learning environments where there is a greater emphasis on learning by exploring, questioning, applying, discussing analysing, collaborating and doing. The recognition of this need is enshrined by a greatly enhanced allocation of time to these methods of learning in GMR, 2019.

Deriving teaching learning methods from competencies

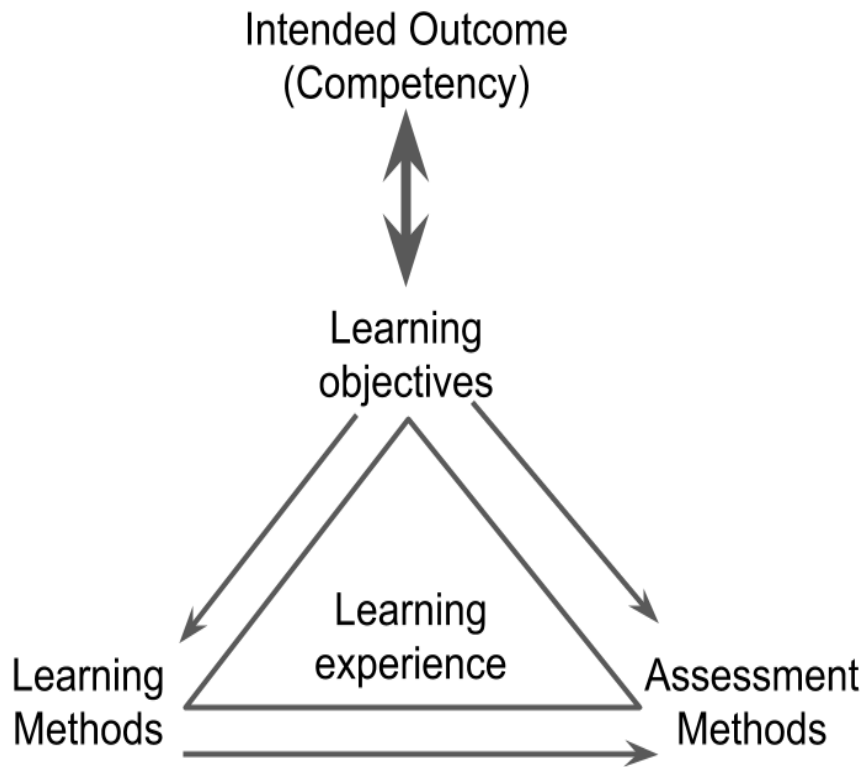
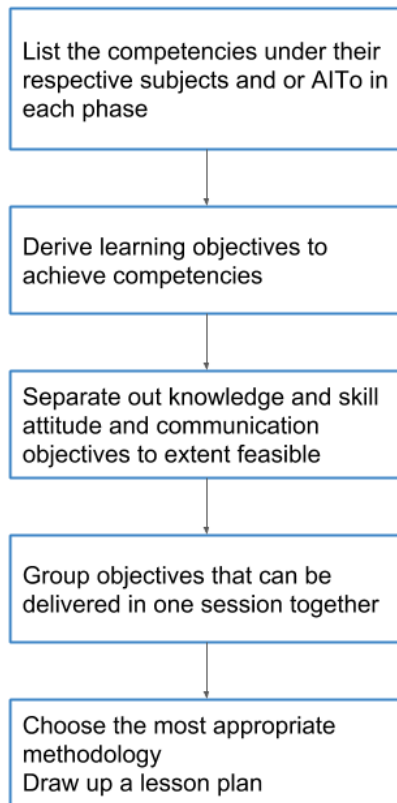


Figure 2: Relationship between outcomes, assessment and learning

The overall relationship between competencies learning and assessment is pictorially represented in figure 2.

The overall approach to deriving learning methods from competencies is summarised in figure 3.



KGS 2018

Figure 3: Steps in deriving learning methods

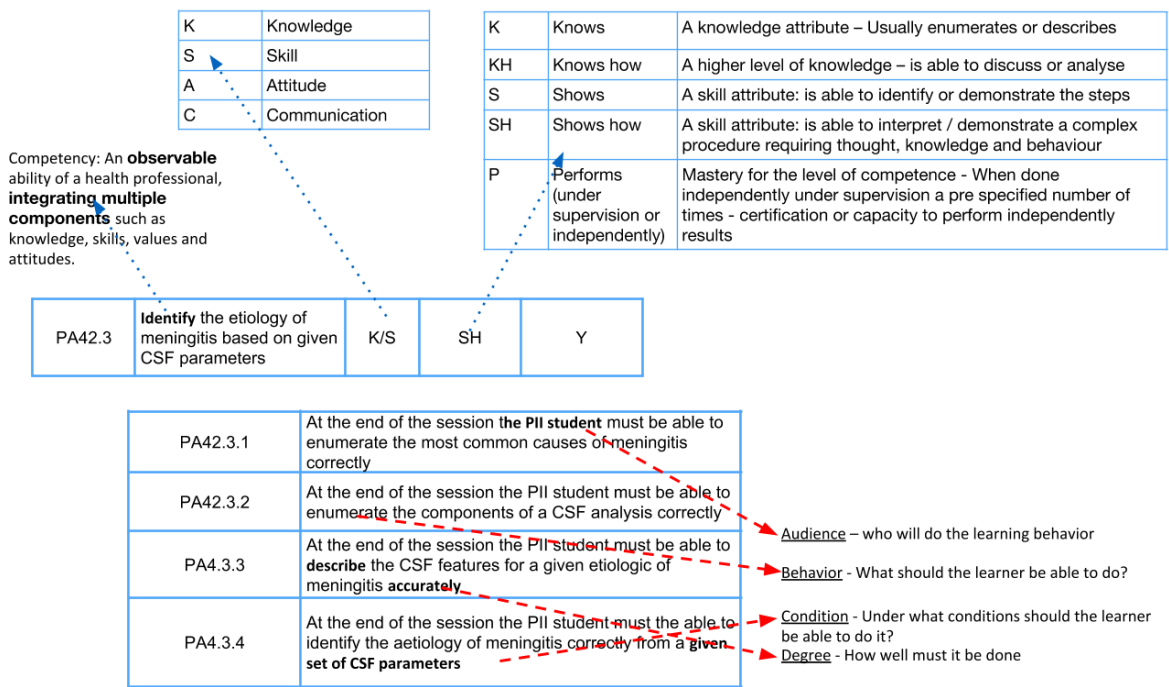
1. Grouping competencies and aligning them in an organ system or disease based aligned and integrated topic as outlined in the integration section of this document
2. The next step is to break down competencies into measurable objectives. The method that is usually used to create objectives is the Audience Behaviour Condition Degree (ABCD). One advantage of writing objectives in this manner is that the learning method and the assessment method are instantly apparent. A sample worksheet is provided in Appendix 1 of this section. This is illustrated in figure 4.
3. Learning sessions are created grouping together objectives that can be taught together. Choosing the correct learning method is a function of the objective, the domain, the level and importantly the faculty student ratio (figure 5 and appendix 1).
4. Knowledge domain objectives with lower cognitive level achievements lend well to traditional classroom. KH level achievements require small group sessions that allow greater student involvement, interaction with ability to probe student understanding

and application. The higher the cognitive level of the objective of the competency, the greater is the requirement of a learning setting with a low student-teacher ratio.

5. There are many competing constraints that restrict the choice of small group learning sessions. These include faculty comfort burden and training, student motivation and involvement, infrastructure support and resources. Therefore, a balanced approach to the use of this setting is required as illustrated in figures 6 and 7.
6. In conditions where a lower student teacher ratio is required but not feasible - several strategies can be adopted including greater student responsibility, greater use of process vs subject experts, technology, innovative large group techniques such as the flipped classroom and the large group case discussion.

Examples of suggested teaching-learning methods to be used for each competency are provided for each competency in the competency table (figure 1).

Deriving learning objectives from competencies



Objective: Statement of what a learner should be able to do at the end of a specific learning experience

Figure 4: Deriving learning objectives from competencies

Deriving learning method from competencies

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

PA42.3	Identify the etiology of meningitis based on given CSF parameters	K/S	SH	Y
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Objective: Statement of what a learner should be able to do at the end of a specific learning experience

PA42.3.1	At the end of the session the PII student must be able to enumerate the most common causes of meningitis correctly	<p>Related objectives can be combined into one teaching session</p> <p>Lecture or small group discussion</p> <p>small group discussion Practical session</p>
PA42.3.2	At the end of the session the PII student must be able to enumerate the components of a CSF analysis correctly	
PA4.3.3	At the end of the session the PII student must be able to describe the CSF features for a given etiologic of meningitis accurately	
PA4.3.4	At the end of the session the PII student must be able to identify the aetiology of meningitis correctly from a given set of CSF parameters	

9

Figure 5: Deriving learning methods from objectives

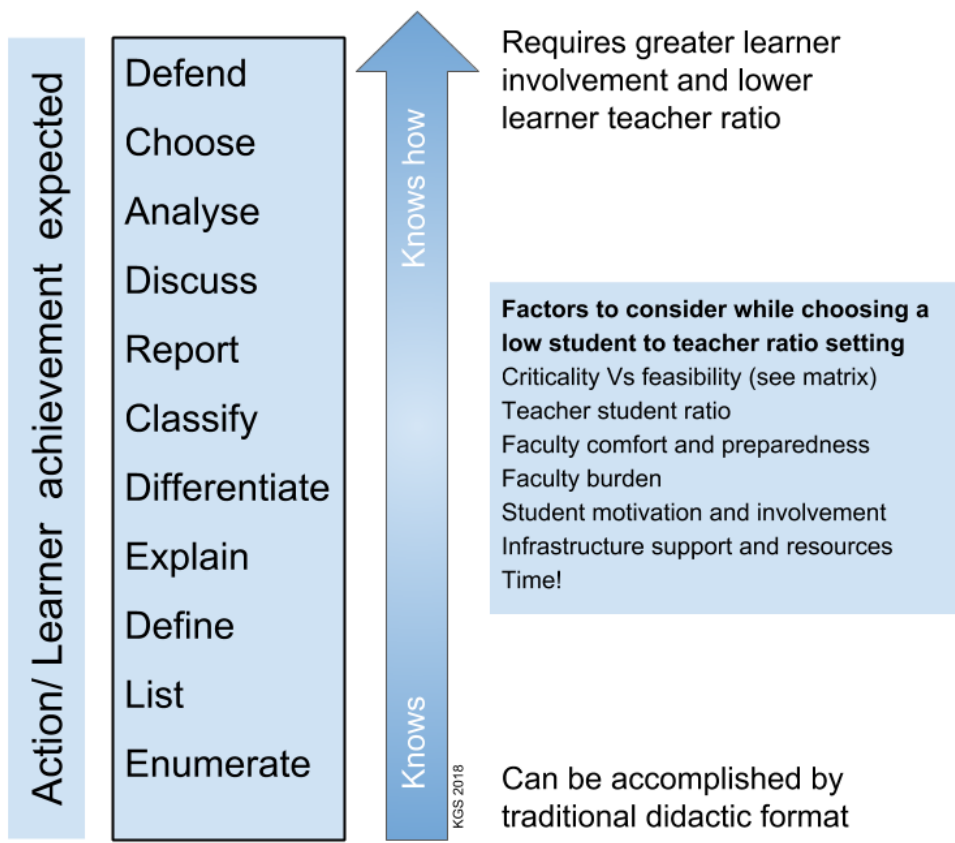


Figure 6: Factors to be considered while choosing TL methods in the cognitive domain. Higher level of cognition required lower teacher to student settings. The choice must consider other factors.

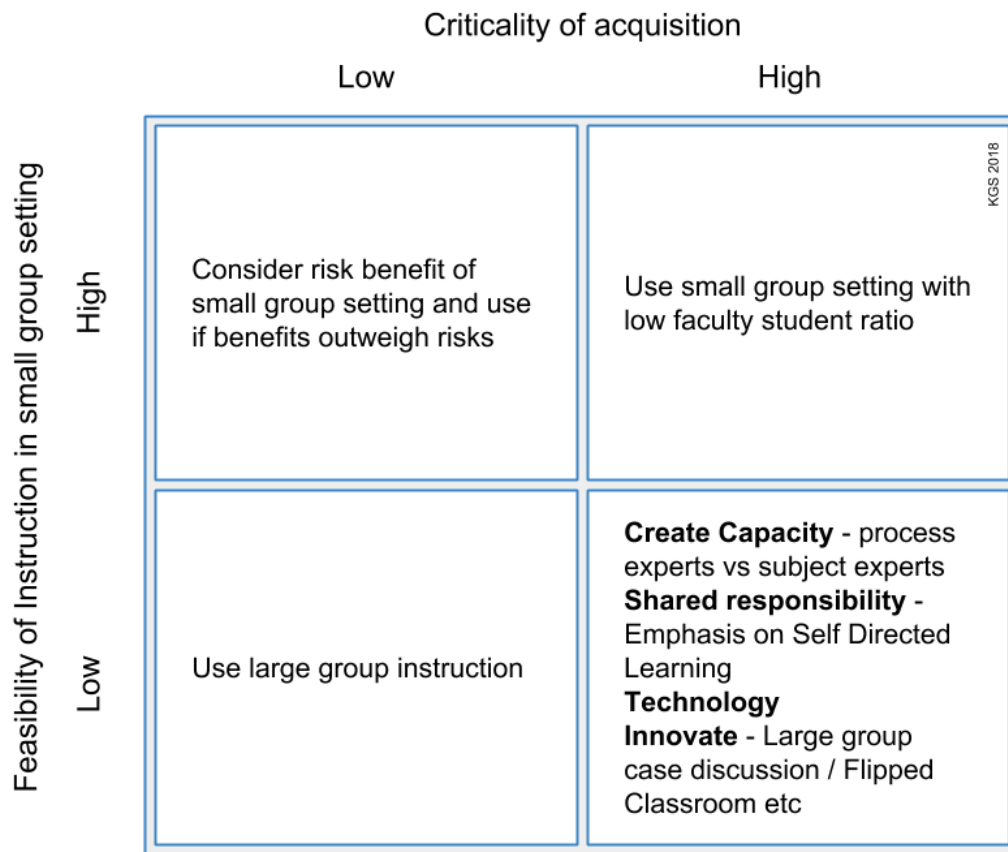


Figure 7: Criticality vs feasibility matrix for choosing a low teacher student ratio setting of instruction

7. Varying levels of competence are required for skill level objectives. The most crucial of them require certification of independent performance; others require the ability to demonstrate steps in a simulated or controlled environment; some may merely need observation in the MBBS program. These sessions have been called DOAP sessions in the competency table and are dealt in detail in the session on skill acquisition. A criticality vs feasibility matrix for skill sessions is also provided.
8. It must be remembered that multiple sessions (often addressing different domains) in a phase in the same and different subjects AND across multiple phases may be required to achieve a particular competence

Sample Worksheets

Deriving Objectives from Competencies

Competency:

I. Objective development worksheet :

No.	Audience	Behaviour	Condition	Degree

II. Transfer your developed objectives into this sheet

No	Objective	Domain K/S/A/C	Level (K/KH/S/SH)	Departments(s)	A/I (Y/N) (H/V)

A/I: Alignment/Integration; H/V: Horizontal/Vertical

III. Choosing a Teaching-Learning Method Worksheet

Major / Sub Competency:

Name of Topic:

Identified Learning Objectives:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

Target Audience:

Number of students:

Parameter	Method 1	Method 2	Method 3
Advantages			
Disadvantages			
Infrastructure/Aids required			
Faculty preparation required			
Other Issues			

Method Chosen: (Use summary sheet for further discussion)

IV. Choosing a Teaching-learning method - Summary Sheet

Parameter	Description
Name of the Lesson	
Number of learners	
Objectives of the session	
Primary Teaching Method chosen	
Advantages of the Teaching method chosen	
Possible disadvantages	
Faculty preparation required	
Breakup of the session	Step 1 Step 2 Step 3 Step 4 Step 5
Teaching Aids required	
Infrastructure required	
Student preparation required	
Instant assessment method Chosen	
Other comments	

Alignment and Integration

Objectives

The participant must be able to:

- a. Facilitate the development of an aligned and integrated curriculum in his/her institution as envisaged in the GMR, 2019 document

Glossary of terms used

For the purposes of this document -

Alignment implies the teaching of subject material that occurs under a particular organ system/ disease concept from the same phase in the same time frame i.e., temporally.

Integration implies that concepts in a topic / organ system that are similar, overlapping or redundant are merged into a single teaching session in which subject based demarcations are removed. For the purpose of this document, topics from other phases that are brought into a particular phase for the purpose of reinforcement or introduction will also be considered as integrated topics. In GMR, 2019 time for integrated teaching is clearly demarcated.

Linker is a session that allows the learner to link the concepts presented in an aligned topic

Curricular Element or Program Addressed

Alignment and Integration

Relevant Extract from GMR

10.1 Preamble:

The salient feature of the revision of the medical curriculum is the emphasis on learning which is competency-based, integrated and student-centered acquisition of skills and ethical & humanistic values.

Each of the competencies described below must be read in conjunction with the goals of the medical education as listed in items 2 and 3.

It is recommended that didactic teaching be restricted to less than one third of the total time allotted for that discipline. Greater emphasis is to be laid on hands-on training, symposia, seminars, small group discussions, problem-oriented and problem-based discussions and self-directed learning. Students must be encouraged to take active part in and shared responsibility for their learning.

Subject specific competencies with appropriate alignment and integration are available with Medical Council of India.

10.2 Integration must be horizontal (i.e. across disciplines in a given phase of the course) and vertical (across different phases of the course). As far as possible, it is desirable that teaching/learning occurs in each phase through study of organ systems or disease blocks in order to align the learning process. Clinical cases must be used to integrate and link learning across disciplines.

Description of the curricular program

Concept of integration used in the GMR

Integration is a learning experience that allows the learner to perceive relationships from blocks of knowledge and develop a unified view of its basis and its application (KGS 2018). The GMR, 2019 applies these principles to the extent that will retain the strengths of silo based education and assessment while providing experiences that will allow learners to integrate concepts.

Keeping this in mind the regulations recommend temporal coordination as described by Harden (called alignment in this document) as the major method to be followed allowing similar topics in different subjects to be learnt separately but during the same time frame (figure 1a).

In a small proportion - not to exceed 20% of the total curriculum an attempt can be made to **share** (figure 1b) topics or **correlate** (figure 1c) topics by using an integration or linker session. The integration session most preferred will be a case based discussion in an appropriate format ensuring that elements in the same phase (horizontal) and from other phases are addressed.

Care must be taken to ensure that achievement of phase based objectives are given primacy - the integrative elements from other phases are used only to provide adequate recall and understand the clinical application of concepts. It must be emphasised that integration does not necessarily require multiple teachers in each class. Experts from each phase and subject may be involved in the lesson planning but not in its delivery unless deemed necessary.

As much as possible, the necessary correlates from other phases must also be introduced while discussing a topic in a given subject - **Nesting** (figure 1 d) (Harden).

Topics that cannot be aligned and integrated must be provided adequate time in the curriculum throughout the year. These concepts are summarised in table 1.

Assessment will continue to be subject based. However effort must be made to ensure that phase appropriate correlates are tested to determine if the learner has internalised and integrated the concept and its application.

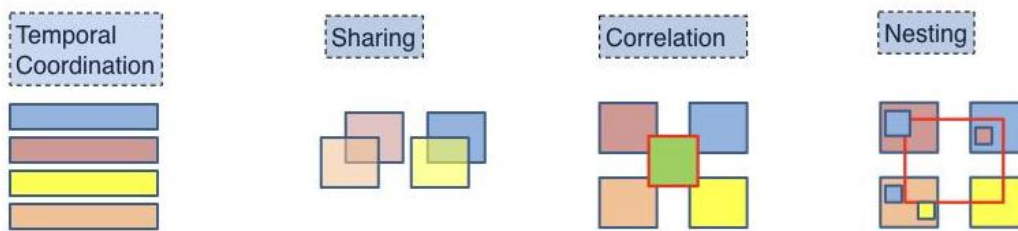


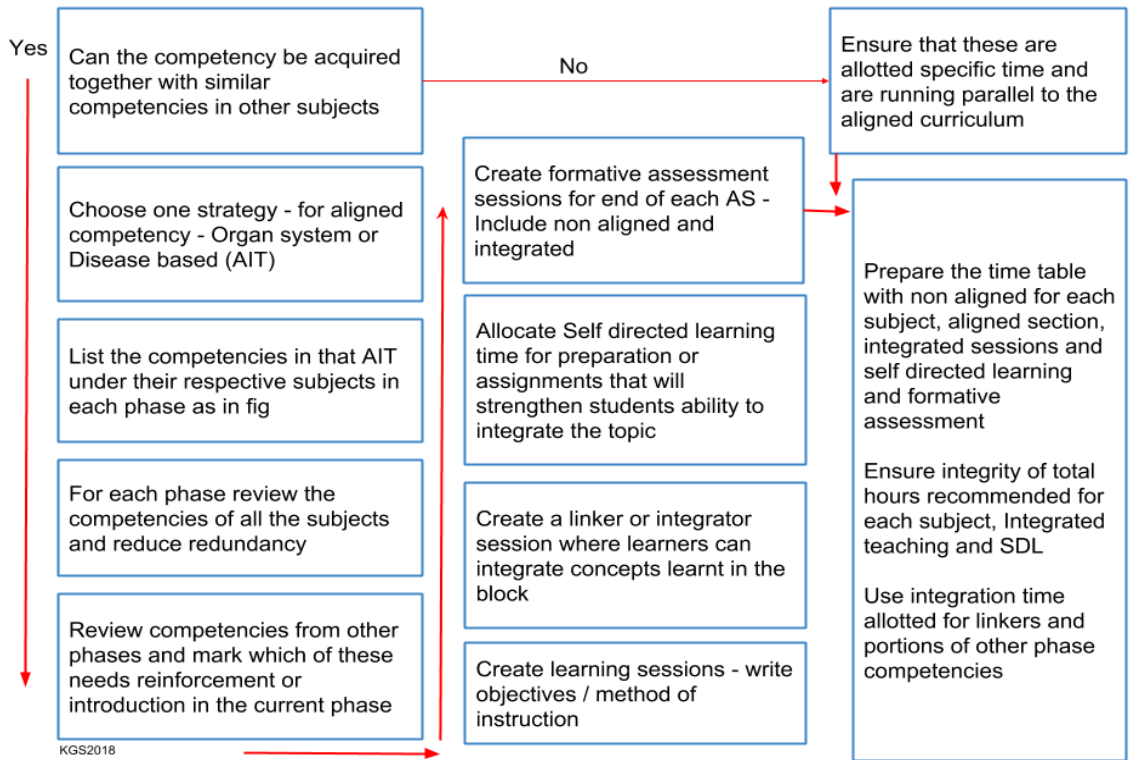
Figure 1

Figure 1: Integration concepts framed in the GMR. Coloured boxes represent subjects. 1 a. Temporal coordination: The timetable is adjusted so that topics within the subjects or disciplines which are related, are scheduled at the same time. b. Sharing: Two disciplines may agree to plan and jointly implement a teaching program c. Correlation: the emphasis remains on disciplines or subjects with subject-based courses taking up most of the curriculum time. Within this framework, an integrated teaching session or course is introduced in addition to the subject-based teaching (green box with red border) d. Nesting: the teacher targets, within a subject-based course, skills relating to other subjects. Adapted from Harden R Med Edu 2000. 34; 551

Table 1 Considerations for using alignment and integration in the curriculum

Competency /Objective	Same Phase	Different Phase
Cannot be taught in a particular topic	Teach separately	-
Can be taught together in different sessions in the same topic	Align	Align From earlier phase to reinforce a concept From later phase to introduce a concept or create relevance
Can be taught in the same session in the same topic	Integrate	Integrate From earlier phase to reinforce a concept From later phase to introduce a concept or create relevance
Can be used to link concepts taught in a particular topic	Linker (Usually Linkers are from a higher phase)	Linker (Usually a clinical condition problem or case)

Figure 2 - Overview of process to create an aligned and integrated topic



Creating an aligned and integrated topic

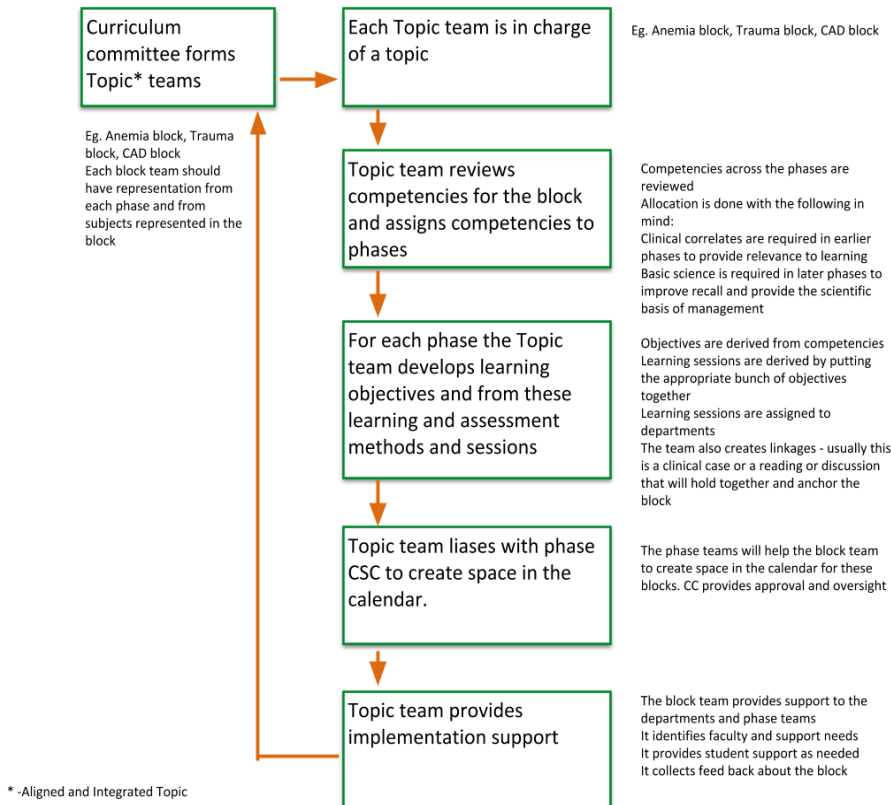


Figure 3: Steps in development of an aligned and integrated topic

Step 1: Identify a list of topics or organ systems that will be accommodated in the timetable as aligned and integrated topics (AITo). Examples of such topics included : Anemia, Febrile illnesses, Trauma etc are provided in Appendix 1.

Step 2: From the subject wise competency document book developed by the MCI transfer the competences that address the topic into a template. A sample is provided Arrange these competencies according to phase and subject. Examples for the topics are available in appendix 1 and presented in Appendix 2. A glossary to understand competencies is available in Appendix 3.

Step 3: For each competency derive learning objectives, learning sessions and assessment methods (figures 4 - 6).

- a. A learning session is created by putting together a bunch of objectives that can be accomplished in the allotted time and/or require a similar method of instruction.
- b. A bunch of learning sessions that are put together that address the topic from different subjects in the phase form an Aligned and Integrated Topic (AITo)

Step 4: In each AITo of the phase, it is important to review competencies from the previous phase that will bear reinforcement in the current phase. Similarly, it is important to ensure that competencies in the next higher phases are reviewed to explore if some of these require introduction in this phase. Integration sessions allotted in each phase may be used to deliver these competencies.

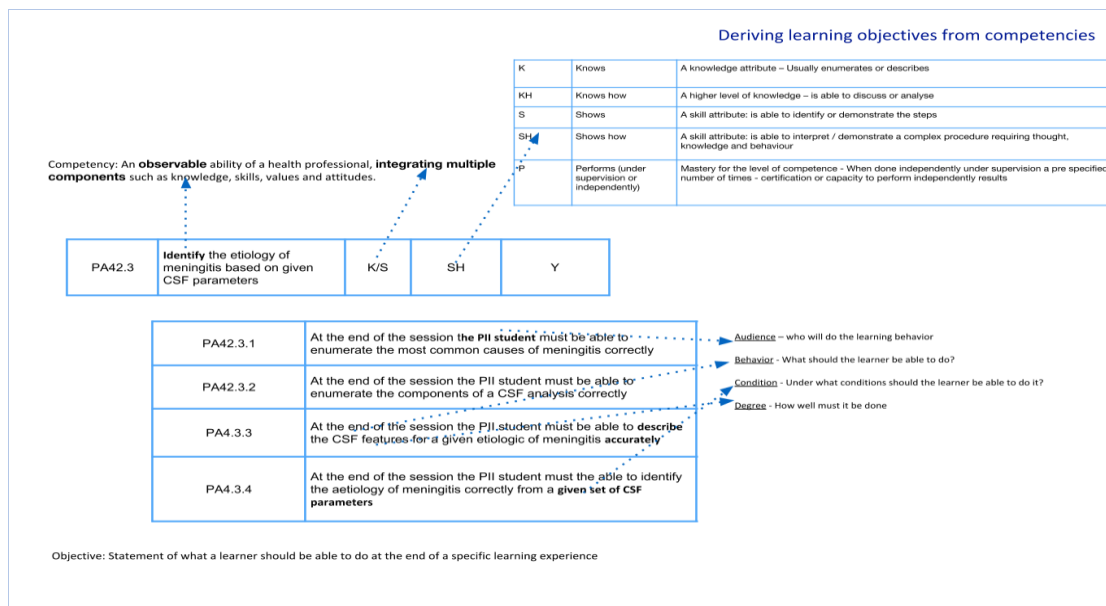


Figure 4 - Deriving learning objectives from competencies

- a. By reviewing objectives / competencies in a phase redundant ones and those in each subject that can be thought together without a subject demarcation can be identified for horizontal integration.
- b. Similarly by reviewing objectives or competencies across phases those with a common thread can be identified for vertical integration. These are illustrated in figures 7-9.
- c. Objective writing and session planning must be done with teachers of all subjects involved in the aligned and integrated topic (AITo) and their inputs taken for the integrated session.

- d. It is important to remember that *the concept and not necessarily teachers* have to be integrated. Using different teachers in each integrated session is nice but rarely required

Step 5: Consider adding a linker to each AITo. A linker as defined above is a session that aptly links the various related standalone elements represented in a AIT In the medical curriculum the linker is most commonly a case. A case that is creatively written can be used in each phase (often the same case) to allow students to correlate what they have learnt and apply into understanding disease process, diagnosis and care. Using a case based discussion to in small groups will in addition encourage collaborative and self directed learning. Using the case discussion at different time points in AITo will allow students to reinforce and link concepts appropriately

Deriving learning method from competencies

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

PA42.3	Identify the etiology of meningitis based on given CSF parameters	K/S	SH	Y
--------	---	-----	----	---

Objective: Statement of what a learner should be able to do at the end of a specific learning experience

PA42.3.1	At the end of the session the PII student must be able to enumerate the most common causes of meningitis correctly	<p>Related objectives can be combined into one teaching session</p> <p>Lecture or small group discussion</p> <p>small group discussion Practical session</p>
PA42.3.2	At the end of the session the PII student must be able to enumerate the components of a CSF analysis correctly	
PA4.3.3	At the end of the session the PII student must be able to describe the CSF features for a given etiologic of meningitis accurately	
PA4.3.4	At the end of the session the PII student must the able to identify the aetiology of meningitis correctly from a given set of CSF parameters	

Figure 5. Deriving learning methods from competencies

Deriving assessment method from competencies

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

PA42.3	Identify the etiology of meningitis based on given CSF parameters	K/S	SH	Y
--------	---	-----	----	---

Objective: Statement of what a learner should be able to do at the end of a specific learning experience

PA42.3.1	At the end of the session the PII student must be able to enumerate the most common causes of meningitis correctly	Short note or part of structured essay: Enumerate 5 causes of meningitis based on their prevalence in India
PA42.3.2	At the end of the session the PII student must be able to enumerate the components of a CSF analysis correctly	Short note or part of structured essay: Enumerate the components tested in a CSF analysis
PA4.3.3	At the end of the session the PII student must be able to describe the CSF features for a given etiologic of meningitis accurately	Short note or part of structured essay: Describe the CSF findings that are characteristic of tuberculous meningitis
PA4.3.4	At the end of the session the PII student must be able to identify the aetiology of meningitis correctly from a given set of CSF parameters	Short note / part of the structured essay/ Skill station/ Viva: Review the CSF findings in the following patient and identify (write or vocalise) the most likely ethology

Figure 6: Deriving assessment methods from competencies

Deriving integration from competencies

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

MI2.4	List the common microbial agents causing anemia. Describe the morphology, mode of infection and discuss the pathogenesis, clinical course, diagnosis and prevention and treatment of the common microbial agents causing Anemia.	K	KH	Y	Didactic Small group	Written Viva	Medicine	Pathology
-------	--	---	----	---	-------------------------	-----------------	----------	-----------

Objective: Statement of what a learner should be able to do at the end of a specific learning experience

MI2.4.1	Enumerate the common microbial agents causing anaemia	<p>Integrate concept - not necessarily teachers Plan session with teachers of both subjects -Teachers from both subjects usually not needed to Ensure redundancy and duplication removed by reviewing both subjects</p> <p>Horizontally aligned and integrated with pathology</p> <p>Vertically integrated with general medicine</p> <p>Integrate concept - not necessarily teachers Plan session with teachers from both phases Make a decision on how much of the information needs to be brought to this phase to make it relevant Consider how a competency can ascend over phases For eg - can be at a KH - know how in phase II but become a SH in phase III For vertical integration with clinical subjects use of a case to link the concept (a well written paper case is sufficient. Using teachers from both phases is rarely required</p>
MI2.4.2	Describe the morphology of agent (1,2 etc)	
MI2.4.3	Describe the mode of infection of agent in humans	
MI2.4.4	Discuss the pathogenesis of anemia caused by agent	
MI2.4.4	Describe the clinical course of infection by agent	
MI2.4.5	Enumerate the diagnostic tests to identify the aetiology of agent as a cause of anaemia	
MI2.4.6	Discuss the methods to prevent infection by agent	
MI2.4.7	Describe the treatment of infection by agent	

Figure 7: Marking objectives/ competencies for integration

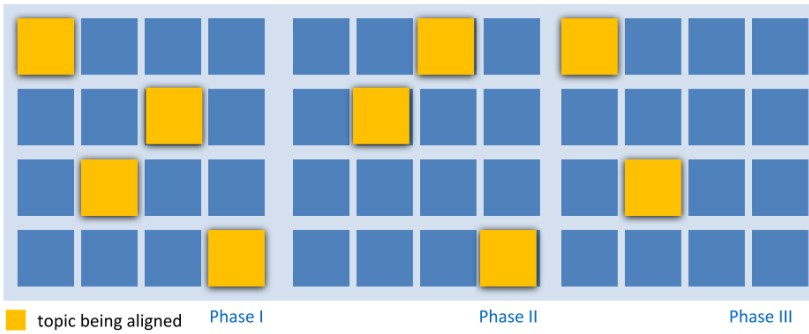
The creation of an aligned and integrated topic (AITo) are pictorially illustrated in figures 8 and 9.

Step 6: Ensure that adequate time for the block is created in the time table. It is important to consider the inclusion of an end of block assessment that will count towards formative/ internal assessment.

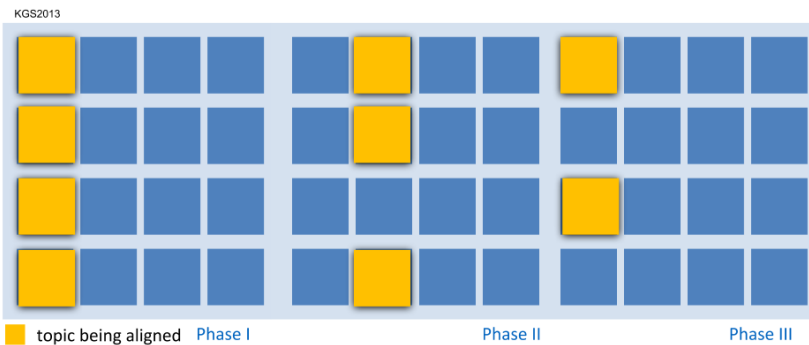
Important: While creating the timetable ensure that topics in each subject that cannot be aligned are also taught simultaneously in each subject and that the timetable accommodates these topics appropriately.

An example timetable incorporating an aligned and integrated topic is available in Appendix 4. The functions of the AIT team in collaboration on CSC and CC in creating the AIT/Block is illustrated in figure 10.

Creating an aligned and integrated topic

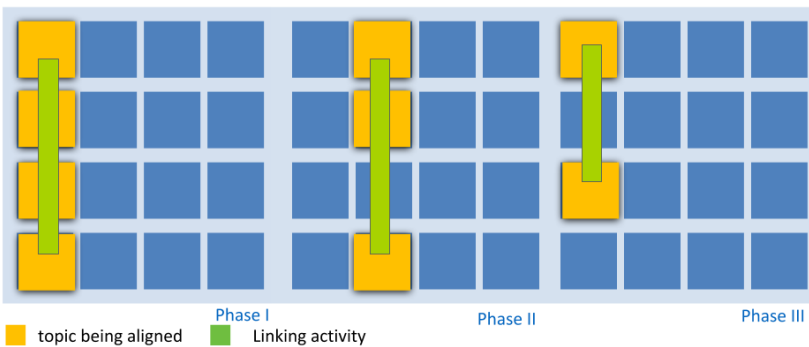


Traditionally topics that have a same core of ideas are thought at different times in different subjects
 In this figure a topic (a bunch of competencies that is taught in different subjects and different phases is represented in orange e.g.. Anemia

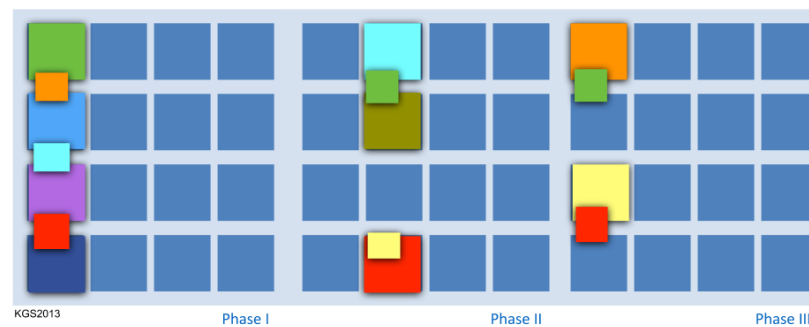


Temporal coordination or alignment is the first step in integration. This is teaching the components of a topics in different subjects at same time period (the same week for instance) This is called a AITO e.g.. Anemia block in each phase

Creating an aligned and integrated topic



While aligning it is desirable to 1.review the components in each subject for redundancy 2. Most curricular programs that are aligned or integrated use a linking activity that will allow students to integrate the concepts from the different subjects. Usually this is a case - that is written with sufficient challenges so that students can apply the principles that they learn. A small group discussion held periodically in the block with a facilitator is one way to achieve this.



Vertical integration is achieved by a small appropriate portion of the topic from one phase in the same AIT in a different phase. For e.g. in phase I concepts from phase II and phase III are taught to give the necessary clinical relevance. Similarly concepts in phase 3 concepts form phase I and phase II are taught to reinforce basic concepts and provide a basis for further clinical learning

Colors used to represent the same topic in different subjects. The size represents the fact that a small percent of a subject is taught in other phases

Figures. 8 and 9. Pictorial illustration of creating horizontal alignment and horizontal vertical integration

Appendix 1

Example topics developed by the RCB for the aligned and integrated topics (indicative)

- Anemia
- Jaundice
- Diabetes
- Thyroid Diseases
- Nutrition
- Febrile Illness
- Tuberculosis
- Malaria
- Diarrhoea
- Ischemic Heart Disease
- Polycystic Ovarian Syndrome

Appendix 2

Understanding the competencies table

1	2	3	4	5	6	7	8	9	10
No.	Competencies	Domain	K/KH/SH/P	Core	Suggested Teaching Learning method	Suggested Assessment method	No req to certify P	Vertical Integration	Horizontal integration
Physiology									
Summary Name of Topic: General Physiology Number of competencies: (08)									
Number of procedures that require certification: Nil									
PY1.1	Describe the structure and functions of a mammalian cell	K	KH	Y	Lectures, Small group discussion	Written/viva			Biochemistry
GM25.4	Elicit document and present a medical history that helps delineate the aetiology of these diseases that includes the evolution and pattern of symptoms, risk factors, exposure through occupation and travel	S	SH		bed side clinic, DOAP	Skill assessment	no of times a skill needs to be done independently to be certified for independent performance Rarely used in UG	Community Medicine	
<p>Unique number of the competency First two alphabets represent the subject (see list) Number following alphabet reflects topic Number following period is a running number</p> <p>Description of competency</p> <p>Identifies the domain or domains addressed K - Knowledge S - Skill A - Attitude C - Communication</p> <p>Identifies if the competency is core or desirable. Y indicates Core</p> <p>Identifies the level of competency required based on the miller's pyramid K - Knows KH- Knows How S - Skill SH - Show How P - Perform independently</p> <p>Identifies the suggested learning method. DOAP - Demonstrate (by student) Observe Assist Perform</p> <p>Identifies the suggested assessment method Skill assessment - Clinics, Skills lab, Practicals etc</p> <p>Subject(s) in other phases with which the competency can be vertically integrated to increase relevance or improve basic understanding</p> <p>Subject(s) in the same phase with which the competency can be horizontally integrated or aligned to allow a more wholesome understanding</p>									

Appendix 3

Sample time table with AIT

Time	Day1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	DAY 8
8-9 am	Blood and its components by a Hematologist Linker-Case 1 PY 2.1 Describe the composition and functions of blood and its components		Linker Part A of case 1 addresses PY 2.1 PY 2.2 PY 2.9 small group discussion + Formative assessment					Written Assessment PY 2.5 PA 13.3
9-10 am	Blood groups , Principles of Blood transfusion and banking PY 2.9 Describe different blood groups and discuss the clinical importance of blood grouping, blood banking and transfusion	Blood groups , Principles of Blood transfusion and banking PY 2.9 Describe different blood groups and discuss the clinical importance of blood grouping, blood banking and transfusion	Erythropoiesis - Linker part B PY 2.5 Describe RBC formation (erythropoiesis & its regulation) and its functions PA 13.1 Describe hematopoiesis and extra medullary hematopoiesis	Role of Iron and Vit A B12 in Erythropoiesis PA 14.1 Describe iron metabolism PA 15.1 Describe the metabolism of Vitamin B12 and the etiology and pathogenesis of B12 deficiency	Haem synthesis and metab PY2.3 Describe & discuss synthesis & functions of Hb & explain its breakdown. Describe Hb variants BI 6.11 Describe the functions of haem in body and describe the processes involved in its metabolism and derangements associated. Porphyrins	Types of hemoglobin and their clinical significance BI 6.12 Describe the major types of Hb and its derivatives found in body and their physiological/ pathological relevance.	Physiology of Hemolysis and Anemia PA 13.3 Define and classify anemia PY 2.5 Describe different types of anemias & Jaundice	Linker Part B of case 1 addresses PY 2.3 , BI 6.12 ,PY 2.9 , PA 13.3 small group discussion + Formative assessment
10 - 11 am	PY 2.9 Group A) Visit to the blood bank Group B) PY 2.11 Blood Grouping cross matching DOAP session	PY 2.9 Group B) Visit to the blood bank Group A) PY 2.11 Blood Grouping cross matching	Peripheral smear examination Group A PY 2.1 Describe the composition and functions of blood and its components OBJ A) Identify RBC , WBC and platelet in normal peripheral smear B) Discuss their functions Group B Visit to Hematology lab / Or ALC animation	Physiology practical Group A PY 2.11 Estimate RBC count and interpret normal Group B PY2.11 Estimate Hb, RBC indices and interpret PA 13.4 Enumerate and describe the normal blood parameters	Physiology practical Group B PY 2.11 Estimate RBC count and interpret normal Group A PY2.11 Estimate Hb, RBC indices and interpret PA 13.4 Enumerate and describe the normal blood parameters	Physiology practicals Group A PY 2.12 Demonstrate the tests for ESR, Hematocrit. Note the findings and interpret the results Group B PY 2.12 Demonstrate Osmotic fragility test . Note the findings and interpret the results	Physiology practical Group B PY 2.12 Demonstrate the tests for ESR, Hematocrit. Note the findings and interpret the results Group A PY 2.12 Demonstrate Osmotic fragility test Note the findings and interpret the results	Skill assessment PY 2.9 , PY 2.11 , PA 13.4 ,PY 2.12
1-2 pm	Plasma Proteins PY 2.2 Discuss the origin, forms, variations and functions of plasma proteins	Blood groups , Principles of Blood transfusion and banking PY 2.1 , 2.2 PY 2.9 Formative Assessment Reflective exercise						Feedback-
2-3 pm	Non Aligned sessions in Anatomy					Radiological ANATOMY	Osteology	Remedial
3-4 pm						Surgical Anatomy	Surface Anatomy	
Submissions					PY 2.5 PA 14.1 PA 15.1 Assignment- 1 on Erythropoiesis and factors regulating	PY 2.3 BI 6.11BI 6.12 Assignment 2 on Haem synthesis and metabolism		

Required Reading

1. Ronald M Harden, The integration ladder: a tool for curriculum planning and evaluation, Medical Education 2000;34:551±557.
2. Alam Sher Malik & Rukhsana Hussain Malik, Universiti Teknologi MARA, Malaysia Twelve tips for developing an integrated curriculum" > Medical Teacher 2011; 33: 99–104.
3. David G. Brauer & Kristi J. Ferguson 1 Washington University School of Medicine, USA, University of Iowa, USA The integrated curriculum in medical education: AMEE Guide No. 96.
4. Integration of basic and clinical sciences - AMEE 2008 Paul Bradley and Karen Mattick, Peninsula College of Medicine and Dentistry, UK, <https://amee.org/getattachment/Conferences/AMEE-Past-Conferences/AMEE-Conference-2008/Introduction-to-Medical-Education-Bradley-Mattick.pdf>.

Additional reading

1. Integrated Medical Curriculum: Advantages and Disadvantages. Gustavo a. Quintero et al. Journal Of Medical Education And Curriculum Development.

Electives

Introduction

Elective can be defined as a brief course made available to the learner during his/her undergraduate study period, where she/he can choose from the available options depending upon their interest and career preferences. This provides an opportunity in the form of an elective course, where an undergraduate medical student can explore his/her deeper interest areas, by working in a medical specialty in hospital/ community setting or undertake a project under an identified expert, which can be an important component in the undergraduate medical education. A student can be helped in identifying his/her future career path by direct experiences in diverse areas. An elective is not being offered by medical schools in India till now.

Introduction of electives in undergraduate medical curriculum is an important step for providing flexible choices in student's areas of interest, direct individual experience and this will help in developing self-directed learning skills.

The range of electives that can be offered to the students will depend upon the local logistics and resources available for the medical institutions (within or nearby). These can be in a wide range that can include electives from educational, community and research-project related, directly or indirectly with health care, super-specialty clinical electives and specific laboratory electives.

Relevant Extract from GMR:

Method:

9.3.2 Two months are allotted for elective rotations after completion of the exam at end of the third MBBS Part I examination and before commencement of third MBBS Part II.

9.3.3 It is compulsory for learners to do an elective. The protected time for electives should not be used to make up for missed clinical postings, shortage of attendance or any other purpose.

9.3.4 Structure

- (a) The learner shall rotate through two elective blocks of 04 weeks each,
- (b) Block 1 shall be done in a pre-selected preclinical or para-clinical or other basic sciences laboratory OR under a faculty researcher in an ongoing research project. During the electives regular clinical postings shall continue.

- (c) Block 2 shall be done in a clinical department (including specialties, super-specialties, ICUs, blood bank and casualty) from a list of electives developed and available in the institution OR as a supervised learning experience at a rural or urban community clinic.
- (d) Institutions will determine the number and nature of electives beforehand , names of the supervisors, and the number of learners in each elective based on the local logistics, available resources and faculty.

9.3.5 Each institution will develop its own mechanism for allocation of electives.

9.3.6 It is preferable that electives are made available to the learners in the beginning of the academic year.

9.3.7 The learner must submit a learning log book based on both blocks of the elective.

9.3.8 75% attendance in the electives and submission of log book maintained during elective is mandatory for eligibility to appear in the final MBBS examination.

9.3.9 Institutions may use part of this time for strengthening basic skill certification.

Description of the curricular program

Objectives:

To provide learner with opportunities

- for a wide spectrum of learning experiences
- to carry hospital/ community based research projects which stimulate enquiry, self-directed, experiential learning and lateral thinking

Intent:

The purpose of introducing electives in the undergraduate curriculum is to:

- allow flexibility and choice during study period
- provide opportunity to explore their areas of interest that can supplement their future studies
- develop self directed learning skills
- have direct experience of working in their interest areas
- develop ability of deeper learning and critical thinking through reflection
- have a student centric component in curriculum

Elements and components of the program:

1) Faculty Development:

The existing MCI curriculum for UG does not have electives and thus faculty as well as institutions need to be trained to implement this new element.

2) Incorporation in the curriculum:

List of electives offered by the institution must be displayed for students. Each elective should have well defined objectives, expected outcomes, expectations from the students, their assessment mechanism and faculty guide or mentors. A faculty mentor should guide the student, monitor their learning activities and assess the students' performance with regular feedback.

Curricular delivery:

Method:

- Two months are designated for elective rotations after completion of the examination at end of the third MBBS Part I and before commencement of third MBBS Part II
- It is compulsory for learners to do an elective.
- The protected time for electives should not be used to make up for missed clinical postings, shortage of attendance or any other purposes.

Curricular governance and evaluation of the program (Person responsible, evaluation periodicity, methods, reporting)

Each medical institution will be primarily responsible for the elective postings. Dean's office in each medical college will identify a person/office/department/ MEU in the college who will be assigned the task of identifying, organizing and taking all administrative responsibilities for the elective postings.

The responsible person/office/department/ MEU will identify possible electives within and outside institution that can be offered to the students. These need to be specified and communicated to the students at the beginning of the academic year. The departments and/ or faculty who will guide/ supervise/mentor the students during their elective posting also need to be identified and trained in various requirements of electives.

If resources are available, students may be permitted to do electives in other medical colleges or institutions within/ outside the country with permission of local authorities and Universities.

Examples of some of the electives that may be offered are:

Example of General Electives:

- Bio-Informatics, Tissue Engineering/ Processing,
- Computer & Computer Applications, Immunology,
- Genetics, Human Nutrition, etc. Sports Medicine,
- Laboratory Sciences, Research Methodology,
- Ethics, Accident and Emergencies (A&E),
- Community Projects, HIV Medicine, Tissue Culture,
- Pharmaco-kinetics/-dynamics /-economics,
- Assisted Reproductive Technology, Ethics & Medical Education

Example of List of clinical electives / disciplines(where it can be done):

- Cardiothoracic Surgery, Cardiology, Paediatric Surgery, Gastroenterology
- Infectious Disease, Geriatrics, Psychiatry, Radiodiagnosis
- Neurosurgery, Neurology, Accident & Emergency Medicine
- Rheumatology, Pulmonary Medicine
- Neonatology, Anaesthesia, Oncology
- Dermatology, Endocrinology, Nephrology
- Palliative care, Clinical pharmacology, Physical Medicine and Rehabilitation
- Clinical genetics, Biomedical waste management, Toxicology

Example of Community electives/Places where it can be done:

- District, taluka hospital or PHC
- Community hospital
- Community project
- National programmes

List of Laboratory Electives:

- Biochemistry, Pathology, Microbiology, Virology
- Pharmacology, Forensic Medicine, Molecular biology etc.

Assessment:

- Assessment will be in line with the general assessment pattern document of CBME.

- Electives are compulsory part of medical curriculum and 75% of attendance will be mandatory
- Student should maintain and submit a log book/ portfolio with all academic and non academic activities. For example; Cases seen, examined, investigated, test performed, case operated etc.
- Along with their stories and reflection about each event.
- Students will be assessed in between and at the end of each elective posting.
- Feedback, comments and /or grades about the student's performance by the faculty mentor can be documented with the help of a checklist where both professional and academic attributes can be included.
- Various points that are included in the checklist can be related to clinical skills like history taking/examination, motivation and interest, communication, team work, discipline, documentation etc
- The performance of the students in the electives will also contribute towards internal marks.
- Student's feedback about the elective also needs to be documented in a structured format. This will help in gathering student's perceptions about various aspects of elective posting and help in program evaluation.

List of resources :

Must read

- Lumb A, Murdoch-Eaton D. Electives in undergraduate medical education: AMEE Guide No. 88. Medical Teacher. 2014 Jul 1;36(7):557-72.
- Ankit Agarwal, Stephanie Wong, Suzanne Sarfaty, Anand Devaiah & Ariel E. Hirsch (2015) Elective courses for medical students during the preclinical curriculum: a systematic review and evaluation, Medical Education Online, 20:1, DOI:[10.3402/meo.v20.26615](https://doi.org/10.3402/meo.v20.26615)
- Thompson MJ, Huntington MK, Hunt DD, Pinsky LE, Brodie JJ. Educational effects of international health electives on US and Canadian medical students and residents: a literature review. Academic medicine: journal of the Association of American Medical Colleges. 2003 Mar;78(3):342.

Additional reading

- Hastings, Adrian & Dowell, Jon & Kalmus-Eliasz, Michael. (2013). Medical student electives and learning outcomes for global health: A commentary on behalf of the UK Medical Schools Elective Council. *Medical teacher*. 36. 10.3109/0142159X.2013.849330.
- Harth SC, Leonard NA, Fitzgerald SM, Thong YH. The educational value of clinical electives. *Medical education*. 1990 Jul;24(4):344-53.
- Dana Stys, Wilma Hopman & Jennifer Carpenter (2013) What is the value of global health electives during medical school?, *Medical Teacher*, 35:3, 209-218, DOI:[10.3109/0142159X.2012.731107](https://doi.org/10.3109/0142159X.2012.731107)

Early Clinical Exposure

Introduction:

Students who enter the MBBS course, have little knowledge and experience of medicine as a practical field. Neither will they have insight into the inter-relatedness of its scientific, social, professional and interpersonal dimensions. They look forward to dealing with patients and learning how to take care of them. However, the experience their preclinical experience seems very far removed from the purpose for which they entered the medical field. Students find it difficult to correlate structure, function and metabolic processes without seeing patients and understanding the purpose of what they are learning.

Today it has become clear that the clinical context, which the pre-clinical phase would ultimately serve, should be introduced earlier. Curricula therefore became 'integrated' such that early clinical exposure was introduced alongside the basic and clinical sciences. Students learn both the basic and clinical sciences as such, alongside rich integrating learning activities, be these early clinical contact, clinical skills, communication skills, problem-based or task-based learning sessions and so on. So curricula are settling down with the strength of the scaffolding that the basic and clinical sciences *per se* bring to the student's trajectory of learning, accompanied by contextual development of clinical and communication skills, practice with clinical problems, attachments to primary care and particular patients or families and so on. Early clinical exposure, and the accompanying knowledge and skills development, does not replace the basic and clinical sciences, but rather enriches and contextualizes that learning and offers a wider variety of teaching and learning methods.

Relevant Extract from GMR:

9.1.1 Objectives: The objectives of early clinical exposure of the first-year medical learners are to enable the learner to:

- (a) Recognize the relevance of basic sciences in diagnosis, patient care and treatment
- (b) Provide a context that will enhance basic science learning
- (c) Relate to experience of patients as a motivation to learn

- (d) Recognize attitude, ethics and professionalism as integral to the doctor-patient relationship
- (e) Understand the socio-cultural context of disease through the study of humanities

9.1.2 Elements

- (a) **Basic science correlation:** i.e. apply and correlate principles of basic sciences as they relate to the care of the patient (this will be part of integrated modules).
- (b) **Clinical skills:** to include basic skills in interviewing patients, doctor-patient communication, ethics and professionalism, critical thinking and analysis and self-learning (this training will be imparted in the time allotted for early clinical exposure).
- (c) **Humanities:** To introduce learners to a broader understanding of the socio-economic framework and cultural context within which health is delivered through the study of humanities and social sciences.

Description of the curricular program:

Definition

Although there is no consensus on the definition of ECE in the literature, it can be defined as an “authentic human contact in a social or clinical context that enhances learning of health, illness and/ or disease, and the role of the health professional”, occurring in the early or preclinical years of undergraduate education (taken from the hand-out reference)

Objectives:

1. Recognize the relevance of basic sciences in diagnosis, patient care and treatment.
2. Provide a context that will enhance basic science learning & relate to experience of patients as a motivation to learn
3. Provide an opportunity for observing basic skills in interviewing patients & doctor-patient communication.
4. Recognize attitude, ethics and professionalism as integral to the doctor-patient relationship
5. Understand the socio-cultural context of disease through the study of humanities

Intent:

Purpose for early clinical exposure to students in the 1st year is to:

- Learn basic clinical skills
- Enhance their *motivation* and prepare them towards the purpose for which they entered the profession
- Enable students to *correlate* what they are learning in basic sciences by learning basics clinical skills and observing relevant disease abnormalities
- Encourage students to learn the *professional behavior* of a doctor by observing and being mentored by a clinical teacher
- Provide the context for application of their learning in practice

Elements and components of the program:**Faculty Development:**

While early clinical exposure is widely used, it is not a prominent feature of the existing MCI curriculum. Therefore in the new curriculum which emphasizes horizontal and vertical integration, faculty need to be reoriented to the principles and practice of early clinical exposure with commonly agreed guidelines.

Preclinical faculty need to coordinate and involve in the activities related to hospital visit with clinical faculty

Incorporation in the curriculum:

Some of the key issues in designing a clinically relevant basic science course are;

- Identifying clinically relevant core content and principles of understanding. Avoiding content that is likely to change in a short period of time.
- Developing critical thinking and reasoning skills by offering students opportunities to repeatedly apply their learning in the clinical context of patient care.
- Encouraging students to critically think about problems of health care, evaluate and incorporate new information which is a skill that they will use for the rest of their professional lives.
- Providing opportunities for students to be sensitised to the broader context of health and health care in India and encouraging them to reflect on their role in addressing issues of health care.

Planning of activities & its distribution:

ECE has to be done in practically each of the sessions of basic sciences, preferably for first 10-15 minutes as we do not want to happen it in silo, but want it as an integral part of the basic science curriculum.

Total allotted hours in first year (as per GMR, 2019) is 90 hours which has to be equally divided in the three preclinical subjects. So time available for each subject is 30 hours, which can be further divided as follows:

1. **Basic sciences Correlation** - 18 hours - 3 hour session per month for 6 months can take place with charts, graphics, videos, reports, field visits etc... in class rooms / hospital labs
2. **Clinical Skills** - 12 hours - one 3 hour session per month for four months per department- students in small groups to go with preclinical faculty equipped with observation guides to specified cases being demonstrated by clinicians and observed by first year students
3. **Humanities** - will be merged with AETCOM - no additional time.

Each 3 hour session of clinical skills will have:

- Introduction & instruction: 30 minutes
- Hospital visit: 1 hour 30 minutes
- Summary & conclusion: 30 minutes -
- Reflection: 30 minutes

Assessment: will be in line with the general assessment pattern document of CBME.

A) Internal Assessment:

Internal assessment shall be based on day-to-day assessment, internal examination & Preliminary examination. It shall relate to different ways in which learners participate during teaching-learning like preparation of clinical case for discussion, clinical case study/problem solving exercise, clinical assignments, clinical case presentation, active participation in group discussion for clinical case discussion, a written test related to CBL etc.

1. Regular periodic examinations shall be conducted throughout the course.
2. Day to day records, reflective writing and log book (which can be appropriately modified) will be given importance in internal assessment. Internal assessment should be based on competencies and skills. A model log book can be provided to medical colleges

B) University Examinations

Modified Essay Questions (Problem based long answer questions), Clinical vignette based Short Answers Questions (SAQ) and objective type questions (e.g. Multiple Choice Questions - MCQ). Viva/oral examination should assess approach to clinical context in the concepts of basic sciences.

Principles of Competency Based Assessment

Introduction

Competency based medical education focuses on outcomes, competencies and learner centeredness in education. This shift has challenged medical educators to look for different ways to teach and assess. CBME does not entail a different type of teaching; what it entails differently is the ongoing assessment to help the teachers find the stage of the learner, need for further interventions and better learning. The International CBME Collaborators have defined competency as an observable activity of health professions integrating multiple components like knowledge, skills, attitudes and communication and used habitually for doing a patient care related task.

Competency is not an all or none phenomenon. Rather it is incremental. The role of teachers is to help the learner acquire and improve upon the competencies. CBME moves away from time bound education and looks at competency as the end point. Consequently, we are no longer interested in demonstration of discrete behaviors by the learners; rather we are interested in application of these in each patient context. Thus, it is more about integration of the required knowledge, skills and attitudes rather than anyone of them in isolation.

There are several misconcepts surrounding competency-based assessment (CBA). Some of those are listed below:

Myth	Reality
Assessment should be performance based	Competency denotes ability of a learner to perform – not weather he actually performs
Assessment of discreet domains can be taken as surrogate of competency	CBA should assess integration of domains in a clinical context
CBA should concentrate of technical skills	Non-technical skills are as important to be taught and assessed.
CBA can be a onetime process	CBA must be an ongoing process
CBA can be norm referenced	CBA must be criterion referenced.

The key approach for CBA is direct observation. It is not concerned with detecting incompetence but helps the learners to acquire competence.

While learning objectives can be straightforward and measurable, competencies are often complex and made up of more than one domain. Many a times, they may require a lot of expert subjective judgment and may show inter-assessor variation. The test of CBA however is more from the point of utility of assessment, mainly its educational impact. The variation can also be countered by increasing the sample size of assessment tasks and assessors.

There is a high context specificity of tasks in clinical area, meaning thereby that attaining one competency in say physical examination does not automatically mean competence in another area say counseling. Therefore, each competency has to be assessed. Internal assessment provides the best opportunity to assess and provide feedback about competencies. A blueprint may be needed to decide which competencies should be assessed during internal assessment and which should go to summative or University examinations. Since the purpose of ongoing assessment is improving the competencies, not all assessments should contribute to pass/fail decisions.

Objectives of the document:

- To enable the faculty to plan effective assessment for CBME
- To enable faculty to understand the changes in assessment proposed in GMER

Glossary of terms used

Assessment: A systematic process of documenting and using empirical data on the knowledge, skill, attitudes, and beliefs to refine programs and improve student learning

CBME: Outcome based education which uses competency framework to design, deliver, *assess* and *evaluate* the curriculum.

Curricular Element or Program Addressed:

Using assessment as a tool to help the learners acquire and improve competencies.

Relevant Extract from GMR

Included in the reading material

The key to success of CBME is the alignment between competencies, TL methods and assessment. Here are some examples of deriving appropriate assessment methods from competencies:

PA42.3*	Identify the etiology of meningitis based on given CSF parameters	K/S	SH	Y
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Objective: Statement of what a learner should be able to do at the end of a specific learning experience

PA42.1*	At the end of the session the Phase II student must be able to enumerate the most common causes of meningitis correctly	Short note or part of structured essay: Enumerate 5 causes of meningitis based on their prevalence in India
PA42.2*	At the end of the session the Phase II student must be able to enumerate the components of a CSF analysis correctly	Short note or part of structured essay: Enumerate the components tested in a CSF analysis
PA42.3*	At the end of the session the Phase II student must be able to describe the CSF features for a given aetiology of meningitis accurately	Short note or part of structured essay: Describe the CSF findings that are characteristic of tuberculous meningitis
PA42.4*	At the end of the session the Phase II student must be able to identify the aetiology of meningitis correctly from a given set of CSF parameters	Short note / part of the structured essay/ Skill station/ Viva voce Review the CSF findings in the following patient and identify (write or vocalise) the most likely etiology

* Numbers given are for illustrative purposes only and should not be compared with numbers in the curriculum document

MI2.4*	List the common microbial agents causing anemia. Describe the morphology, mode of infection and discuss the pathogenesis, clinical course, diagnosis and prevention and treatment of the common microbial agents causing Anemia.	K	KH	Y	Didactic Small group discussion	Written/ Viva voce	Medicine	Pathology
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Objective: Statement of what a learner should be able to do at the end of a specific learning experience

MI2.1*	Enumerate the common microbial agents causing anaemia	<p>Integrate concept - not necessarily teachers Plan session with teachers of both subjects -teachers from both subjects usually not needed. Ensure redundancy and duplication by reviewing both subjects</p> <p>Horizontally aligned and integrated with pathology Vertically integrated with General Medicine</p> <p>Integrate concept - not necessarily teachers Plan session with teachers from both phases. Make a decision on how much of the information needs to be brought down to this phase to make it relevant. Consider how a competency can ascend over phases: for eg. - can be at a KH -(know how) in phase II but becomes SH in phase III. For vertical integration with clinical subjects, use of a case to link the concept (a well written paper, case is sufficient). Using teachers from both phases is rarely required</p>
MI2.2*	Describe the morphology of agent (1,2 etc)	
MI2.3*	Describe the mode of infection of agent in humans	
MI2.4*	Discuss the pathogenesis of anemia caused by agent	
MI2.5*	Describe the clinical course of infection by agent	
MI2.6*	Enumerate the diagnostic tests to identify the aetiology of agent as a cause of anemia	
MI2.7*	Discuss the methods to prevent infection by agent	
MI2.8*	Describe the treatment of infection by agent	

Record keeping is an integral part of CBA. They help the students, teachers and administrators to understand the learning trajectory as well as enable them to take corrective action.

Internal Assessment:

Internal assessment shall be based on day-to-day assessment. It shall relate to different ways in which learners participate in learning process including assignments, preparation for seminar, clinical case presentation, preparation of clinical case for

discussion, clinical case study/problem solving exercise, participation in project for health care in the community, proficiency in carrying out a practical or a skill in small research project, a written test etc.

1. Regular periodic examinations shall be conducted throughout the course. There shall be no less than three internal assessment examinations in each Preclinical / Para-clinical subject and no less than two examinations in each clinical subject in a professional year. An end of posting clinical assessment shall be conducted for each clinical posting in each professional year.
2. In subjects that are taught at more than one phase, proportionate weightage must be given for internal assessment for each Phase. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.
3. Day to day records and log book should be given importance in internal assessment. Internal assessment should be based on competencies and skills. Learners must secure at least 50% marks of the total marks (combined in theory and practicals / clinicals) assigned for internal assessment in a particular subject in order to be declared successful at the final University examination of that subject. The learner should be made aware of the results of Internal Assessment. Each college can build its own mechanism and the calendar of the college should show the details regarding conduct of Internal assessment. Internal assessment marks will reflect as separate head of passing at the summative examination.
4. A candidate who has not secured requisite aggregate in the internal assessment may be provisionally permitted to appear for university examination. However, he/she has to successfully complete the remediation measures prescribed by the institution/ university as the case may be, prior to the declaration of his/her results in that particular phase. Failure to meet prescribed 50% marks in Internal assessment after availing remedial measures will lead to annulment of the results of the candidate in that particular subject(s) in the university examination.

University Examinations

- 11.2.1 University examinations are to be designed with a view to ascertain whether the candidate has acquired the necessary knowledge, minimal level of skills, ethical and professional values with clear concepts of the fundamentals which are necessary for him/her to function effectively and appropriately as a physician of first contact. Assessment shall be carried out on an objective basis to the extent possible.
- 11.2.2 Nature of questions will include different types such as structured essays (Long Answer Questions - LAQ), Short Answers Questions (SAQ) and objective type questions (e.g. Multiple Choice Questions - MCQ). Marks for each part should be indicated separately. MCQs shall be accorded a weightage of not more than 20% of the total theory marks. In subjects that have two papers, the learner must secure at least 40% marks in each of the papers with minimum 50% of marks in aggregate (both papers together) to pass.
- 11.2.3 Practical/clinical examinations will be conducted in the laboratories or hospital wards. The objective will be to assess proficiency and skills to conduct experiments, interpret data and form logical conclusion. Clinical cases kept in the examination must be common conditions that the learner may encounter as a physician of first contact in the community. Selection of rare syndromes and disorders as examination cases is to be discouraged. Emphasis should be on candidate's capability to elicit history, demonstrate physical signs, write a case record, analyze the case and develop a management plan.
- 11.2.4 Viva/oral examination should assess approach to patient management, emergencies, attitudinal, ethical and professional values. Candidate's skill in interpretation of common investigative data, X rays, identification of specimens, ECG, etc. is to be also assessed.
- 11.2.5 There shall be one main examination in an academic year and a supplementary to be held not later than 90 days after the declaration of the results of the main examination.

Examinations schedule:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							Foundation Course	I MBBS			
I MBBS								Exam I MBBS	II MBBS		
II MBBS								Exam II MBBS	III MBBS		
III MBBS Part I								Exam III MBBS Part I	Electives & Skills		
III MBBS Part II											
Exam III MBBS Part II		Internship									
Internship											

Marks distribution is given below:

Phase of Course	Written-Theory – Total	Practicals/Orals/ Clinicals	Pass Criteria
First Professional			<u>Internal Assessment:</u> 35% separately in theory and practical for eligibility to appear for University Examinations <u>University Examination</u> Mandatory 50% marks in theory and practical (practical = practical/clinical + viva)
Human Anatomy - 2 papers	200	100	
Physiology - 2 papers	200	100	
Biochemistry - 2 papers	200	100	
Second Professional			
Pharmacology - 2 Papers	200	100	
Pathology - 2 papers	200	100	
Microbiology - 2 papers	200	100	
Third Professional Part – I			
Forensic Medicine & Toxicology - 1 paper	100	100	
Ophthalmology – 1 paper	100	100	
Otorhinolaryngology – 1 paper	100	100	
Community Medicine - 2 papers	200	100	
Third Professional Part – II			
General Medicine - 2 papers	200	200	
General Surgery - 2 papers	200	200	
Pediatrics – 1 paper	100	100	
Obstetrics & Gynaecology - 2 papers	200	200	

List of resources:

- <http://www.jgme.org/doi/10.4300/JGME-D-17-00365.1> Accessed 13.12.2018
- <https://med.ucf.edu/comfacultycouncil/files/2018/08/Core-principles-of-assessment-in-competency-based-medical-education.pdf> Accessed 13.12.18
- <http://medind.nic.in/ibv/t15/i5/ibvt15i5p413.pdf> Accessed 13.12.18

Additional reading

- <https://www.indianpediatrics.net/june2013/553.pdf> Accessed 13.12.2018
- https://amee.org/getattachment/AMEE-Initiatives/MedEdWorld/38074-Outcome_Competency-Med-Ed-WEB.PDF Accessed 13.12.2018
- <https://www.innohealthed.com/video/assessment-needs-for-individualized-competency-%C2%ADbased-medical-education-dr-donald-melnick/> Accessed 13.12.2018

Skills Training and Assessment

Introduction

The new Curriculum focuses on Competencies and Outcome and gives lot of emphasis to skill development in all phases. The competencies where 'Shows How' (SH) or 'P' (Perform) (under supervision or independently) is listed, are related to the skills to be developed by IMG. In case of P, the number required to be performed is also specified. The skill labs pertaining to psychomotor, affective and communications domains thus serves a very important purpose in the new curriculum.

Curricular Element or Program Addressed:

- Development of various skills at different levels and utilization of Skills lab in UG training.
- Implement program for skills training and assessment.

Relevant Extract from GMR

The undergraduate medical education Programme is designed with a goal to create an "Indian Medical Graduate" (IMG) possessing requisite knowledge, skills, attitudes, values and responsiveness, so that he or she may function appropriately and effectively as a physician of first contact of the community while being globally relevant.

3.1. Clinician, who understands and provides preventive, promotive, curative, palliative and holistic care with compassion

3.1.7 Demonstrate ability to perform a physical examination that is complete and relevant to disease identification, disease prevention and health promotion.

3.1.8 Demonstrate ability to perform a physical examination that is contextual to gender, social and economic status, patient preferences and values.

3.1.9 Demonstrate effective clinical problem solving, judgment and ability to interpret and integrate available data in order to address patient problems, generate differential diagnoses and develop individualized management plans that include preventive, promotive and therapeutic goals.

3.3. ***Communicator with patients, families, colleagues and community***

3.3.1 Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.

3.3.2 Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and trustworthy.

3.4. ***Lifelong learner committed to continuous improvement of skills and knowledge***

Description of the curricular program:

Definition

Skill was the term used traditionally to denote procedural skill. However, there has been a paradigm shift and the term is now used (in the present context) to represent any action by the health professional during a clinical encounter, which can result in a change in the health outcome. Thus, in addition to procedural skills, the term now also includes clinical reasoning skills, decision making, team work, task management and Communication skills.

Skill, Competency and Competence

Skill is ability to perform a specialized task with defined expertise.

Competency is the acquisition of skills by repeated practice, under a planned, observable environment, which can also be assessed by standard tools. Competence is doing a task effortlessly with accuracy.

Types of skills:

Following are the types of skills expected to be developed during the medical course:

a. Technical skills, which include

. *Psychomotor skills*

Manual abilities needed towards diagnosing and treating patients.

e.g. - Ability to obtain a blood sample by Venipuncture

. *Communication skills*

Ability to communicate with others in a given situation

e.g. - Ability to motivate relatives for blood donation

b. Non-technical skills, which include

.Team skills

Ability to work together in a team

e.g. Ability to work towards implementing a project/ operating on a patient with the team.

. Intellectual skills

To think in a desirable way- underlining component of knowledge

e.g. - Ability to interpret liver function test results of a patient with jaundice

Objectives:

At the end of the session participants will be able to:

- Understand the concept of skills and competence
- Enumerate general principles, different methods and steps of skills teaching and learning (skill cycle)
- Apply the principles and steps of teaching and learning of skills in the undergraduate medical curriculum at different levels of UG training
- Develop an outline of a skills module in the given framework for a scenario in Cognitive skills, Procedural skills, Communication skills.
- Develop a draft plan for implementation of skills enhancement program in the undergraduate curriculum at their own institution
- Review principles of skills assessment, incorporate these principles into assessment design
- Reflect on and discuss about the processes used in this workshop for skill training and assessment.

Theories of skill learning and application:

Intellectual skills

(from Teaching and assessing clinical reasoning skills. Jyoti Nathmodi, Anshu, Piyush gupta and Tejinder Singh: Indian Pediatrics, vol 52 sept 2015.)

Clinical reasoning is best taught during the course of a clinical encounter either conducted by the physician-teacher (for demonstration), or preferably during observation of a clinical encounter being carried out by the student. Clinical case presentations, case based discussions/ chart stimulated recall, clinical problem solving exercises and

structured case presentation models like SNAPPS and One Minute Preceptor are good settings for teaching clinical reasoning skills.

SNAPPS model can help learners build illness scripts essentially by way of comparing differential diagnoses and clarifications of uncertainties. This method encourages expression of intuitive as well as analytical thinking and promotes self-reflection by the student.

The One Minute Preceptor (OMP) model is another useful model of structured clinical case discussion. In this model, the student presents a case, he/she is then asked to commit to a diagnosis, and is probed for reasoning for the same. The preceptor, now aware of patient as well as student's diagnosis, teaches general rules (e.g. key features, principles of management, effective communication). The final two steps are to reinforce what was done well by the student and to correct the mistakes made. Usually it takes about 10 minutes (arbitrary division of time could be: 6 minutes for case presentation, 3 minutes for questioning and 1 minute for teaching the general rule and feedback). Despite being a teacher initiated model, it drives the student to propose and justify the diagnosis, employing appropriate clinical reasoning skills by the learner.

Reflection and metacognition: Students must be encouraged and provided an opportunity to reflect on their diagnostic approach, and think about what they could be missing.

Deliberate practice (Ericsson) includes finding opportunities for repeated practice, requesting honest feedback on performance at frequent intervals, maximizing learning from each case, reflecting on feedback and errors to improve performance and using mental practice to support clinical experiences. This can be done during regular clinical activities such as, asking students to report back during the morning rounds or after an emergency floor/ call duty.

According to Ericsson these skills are not innate or unchangeable but the result of lifelong and especially deliberate, as in systematic and goal-oriented, practice of an activity. DP involves (a) repetitive practice of the intended skill, combined with (b) the thorough assessment of the skill so that the learner (c) can receive specific, informative feedback, which results in an increasingly (d) better performance of skill. So, according to Ericsson et al., the improved performance of an activity largely depends on how much time one spends actively practicing it – time alone does not suffice to achieve expert

status. Even for skills of little complexity, repetitive practice seems very important and is even indispensable for medium or highly-complex skills.

Performance:

Peyton's Four-Step Approach has proven to be most helpful. The Four-Step Approach consists of the following four clearly defined steps:

1. The trainer demonstrates the skill in real time without giving instructions or explanatory words ("Demonstration").
2. The trainer repeats the procedure, this time describing all necessary sub- steps ("Deconstruction").
3. The trainer performs the skill for a third time, this time following the sub- steps only as described to him by the trainee ("Comprehension"). This step has been identified as the most important step of the Four-Step Approach in the past as deeper processing mechanisms reflecting what was observed in the first two steps are necessary for the trainees' to be able to give instructions.
4. The trainee performs the skill on his/her own ("Performance").

STEPS model

- S** Set the foundation, importance of skill, context
- T** Tutor demonstration without commentary
- E** Explanation with repeat demonstration
- P** Practice under supervision and feedback
- S** Subsequent deliberate practice

SISFR model

- S** Set the context, identify roles and outcome
- I** Immerse in roles and practice for agreed time
- S** Summarize progress
- F** Feedback from tutor
- R** Refine practice

Organizational set up

It requires:

1. **Communication skill lab:** where students will be taught regarding the development of the communication skills like developing the knowledge about

the language of the region, communication with the patients in their own language, patients relatives.

Doctor – Patient, Doctor – doctors, doctor – other health professionals.

2. **Clinical skill lab:** where students will learn the clinical skills before performing the procedures on the patients.

Clinical skills laboratories may consist of a space for seminars, clinical settings, emergency room, outpatient setting, intensive care setting, consulting rooms, procedural skill rooms, operating rooms, different types of simulators. This facility need to simulate the real setting as close as possible.

Simulators can be classified into four types:

1. **A part-time trainer:** training model which represents part of the body or structure that can be used alone or can be attached to simulated patients for simultaneous technical and communication skills development.
2. **A computer-based system** which can be in the form of: (a) multimedia program using audio and video systems; (b) interactive systems which provide the users with clinical variables that can be manipulated to provide feedback on the decisions and actions; (c) virtual reality that creates environments or objects such as computer-generated imaging that replicate kinesthetic and tactile perception.
3. **Simulated patients and environments:** Simulated patients can be professional actors trained to present history and -sometimes mimic physical signs or can be trained patients. Both can be used as standardized patients. Creation of simulated environment is common in CSLs.
4. **Integrated simulators:** These simulators combine manikins with advanced computer controls that can be adjusted to provide various physiological parameter outputs.

The GMR, 2019 clearly states that the aim of teaching the undergraduate student in all pre-clinical, para-clinical and clinical specialties is to impart such knowledge and

skills that may enable him to manage common medical problems in day to day practice. This is reflected in the various sections in GMR related to each subject. Acquisition of such skills is to be ensured in each subject.

Certifiable Procedural Skills: (ref. GMR 2019)

Comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) – Indian Medical Graduate

Specialty	Procedure
General Medicine	<ul style="list-style-type: none"> • <i>Venipuncture (I)</i> • <i>Intramuscular injection(I)</i> • <i>Intradermal injection (D)</i> • <i>Subcutaneous injection(I)</i> • <i>IV injection (I)</i> • <i>Setting up IV and calculating drip rate (I)</i> • <i>Blood transfusion (O)</i> • <i>Urinary catheterization (D)</i> • <i>Basic life support (D)</i> • <i>Oxygen therapy (I)</i> • <i>Aerosol therapy / nebulization (I)</i> • <i>Ryle’s tube insertion (D)</i> • <i>Lumbar puncture (O)</i> • <i>Pleural and ascitic aspiration (O)</i> • <i>Cardiac resuscitation (D)</i> • <i>Peripheral blood smear (I)</i> • <i>Bedside urine analysis (D)</i>

General Surgery	<ul style="list-style-type: none"> • <i>Basic suturing (I)</i> • <i>Basic wound care (I)</i> • <i>Basic bandaging (I)</i> • <i>Incision and drainage of superficial abscess (I)</i> • <i>Early management of trauma (I) and trauma life support (D)</i>
Orthopedics	<ul style="list-style-type: none"> • <i>Application of basic splints and slings (I)</i> • <i>Basic fracture and dislocation management (O)</i> • <i>Compression bandage (I)</i>
Gynecology	<ul style="list-style-type: none"> • <i>Per Speculum (PS) and Per Vaginal (PV) examination (I)</i> • <i>Visual Inspection of Cervix with Acetic Acid (VIA) (O)</i> • <i>Pap Smear (I)</i> • <i>Intra- Uterine Contraceptive Device (IUCD) insertion & removal (I)</i>
Obstetrics	<ul style="list-style-type: none"> • <i>Obstetrics examination (I)</i> • <i>Episiotomy (I)</i> • <i>Normal labor and delivery (including partogram) (I)</i>
Pediatrics	<ul style="list-style-type: none"> • <i>Neonatal resuscitation (D)</i> • <i>Pediatric IV line (I)</i> • <i>Intraosseous line (O)</i>
Forensic Medicine	<ul style="list-style-type: none"> • <i>Documentation and certification of trauma (I)</i> • <i>Diagnosis and certification of death (D)</i> • <i>Legal formalities related to emergency cases (D)</i> • <i>Certification of medical-legal cases e.g. Age estimation, sexual assault etc. (D)</i> • <i>Establishing communication in medico-legal cases with police, public health authorities, other concerned</i>

	<i>departments, etc (D)</i>
Otorhinolaryngology	<ul style="list-style-type: none"> • <i>Anterior nasal packing (D)</i> • <i>Otoscopy (I)</i>
Ophthalmology	<ul style="list-style-type: none"> • <i>Visual acuity testing (I)</i> • <i>Digital tonometry (D)</i> • <i>Indirect ophthalmoscopy (O)</i> • <i>Epilation (O)</i> • <i>Eye irrigation (I)</i> • <i>Instillation of eye medication (I)</i> • <i>Ocular bandaging (I)</i>
Dermatology	<ul style="list-style-type: none"> • <i>Slit skin smear for leprosy (O)</i> • <i>Skin biopsy (O)</i> • <i>Gram's stained smear (I)</i> • <i>Gram's stain smear (D)</i> • <i>KOH examination (D)</i> • <i>Dark ground illumination (O)</i> • <i>Tissue smear (O)</i> • <i>Cautery - Chemical and electrical (O)</i> • <i>Lasers (O)</i> • <i>Chemical (O).</i>

I-Independently performed on patients,

O-Observed in patients or on simulations,

D- Demonstration on patients or simulations and performance under supervision in *patients*

Certification of Skills: Any faculty member of concerned department can certify skills.

For common procedures, the certifying faculty may be decided locally.

Logistics of skills training and assessment:

Responsibilities of Dean of the medical college:

1. To arrange for the necessary logistics for establishment/ maintenance of Skill Labs with focus on psychomotor, affective and communication skills
2. To arrange technical manpower for the above in addition to the faculty.

Responsibilities of the Curriculum Committee:

1. To schedule the usage of skill labs by students of each phases and interns
2. To monitor the smooth conduct of the program
3. To coordinate with the administration and clinical faculty
4. To monitor and submit reports to the Dean

Responsibilities of the MEU:

1. To arrange the sensitization programs for all faculty members (including the Dean & HODs)
2. To train and orient the resource persons
3. To collect the reports and coordinate with NC / RC.
4. To ensure that at least one MEU faculty be monitoring the use of skill labs.

Evaluation: Program effectiveness questionnaire from faculty and students

Reporting: The Curriculum Committee will submit the schedule and report with inputs from students, resource persons, MEU faculty and the MEU coordinator shall forward the same to NC/RC on a quarterly basis. The NC/RC Convener shall forward a consolidated report in the prescribed proforma to the MCI on annual basis.

Assessment planning blueprint process and method**Intellectual skills****Multiple Choice Questions (MCQ)**

MCQ-based examination has the potential of assessing wide content areas across different contexts in a short time. Simple recall type MCQs contribute little to assessment of medical decision making. Clinical problem-solving ability can be assessed by inserting clinical scenarios.

Extended matching questions (EMQs) learners have to pick the answers to context-specific clinical scenarios around a single theme from a list of options.

Assessment of the 'Shows how' in Miller's Pyramid**● The Long Case**

Integrated, in-depth assessment of clinical competence in a realistic setting

Poor inter-case reliability is more of an issue than inter-rater reliability

● OSCE

Objective structured clinical examination

Make stations as authentic as possible

- **Mini Clinical Examination (Mini CEX)**

Short observation during clinical patient contact (10-20 minutes)

Oral evaluation

Generic evaluation forms completed

Repeated at least 4 times by different examiners

Assessment of the 'Does' of Miller's Pyramid

This assessment is done during the performance of the student in the actual set up where the procedure is performed independently. It is done mainly by two methods: DOPS, MSF

DOPS (Direct Observation of Procedural Skills)

Trainee observed by faculty while performing procedure independently in the hospital set up

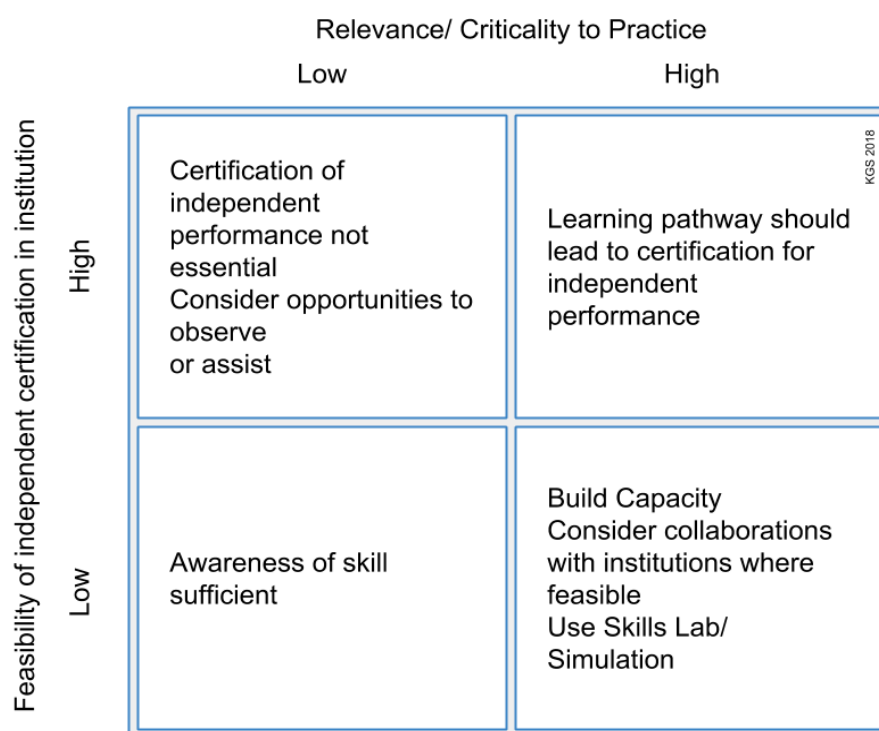
Receives feedback on essential procedural skills

Likely to be more reliable and valid than log book system

MSF (Multi-Source Feedback)

It uses questionnaire data from 8-10 colleagues, medical and non-medical, assessing aspects of performance. The feedback is obtained from teachers, paramedical staff, fellow students, patients, non clinical staff and the relatives of the patients. The feedback is obtained regarding the sincerely, communication skills and the procedural skills.

It is important to bear in mind that not all skills may be assessable at the final examination. Rather, many are better assessed during training. The grid below will help to decide which skills are to be assessed locally and which should be included in the final assessment.



Curricular governance and evaluation of the program:

All teaching Faculty under the leadership of the Dean / Principal; CC and MEU - to be reported in a format to NCs/ RCs to be carried forward to a National Monitoring Team

Evaluation: periodicity, methods, reporting - preferably every two months by the CC, every six months by NC/ RC and six months initially and later annually at the national level.

List of resources:

Must read

1. Daniela Vogel, Sigrid Harendza. Basic practical skills teaching and learning in undergraduate medical education – a review on methodological evidence. *GMS Journal for Medical Education* 2016,vol 33(4). Available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5003143/pdf/JME-33-64.pdf> accessed on 26.12.2018
2. Jyoti Nath Modi, Anshu, Piyush Gupta and Tejinder singh Teaching and assessing clinical reasoning skills. *Indian Pediatrics*, vol 52 sept 2015. Available at <https://indianpediatrics.net/sep2015/787.pdf> accessed on 26.12.2018
3. T. J. Bugaj C. Nikendei, Practical Clinical Training in Skills Labs: Theory and Practice. *GMS Journal for Medical Education* 2016, Vol. 33(4) Available at

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Curricular Governance

Introduction

The development and roll out of the competency driven integrated curriculum marks an important milestone in the evolution of medical education in India. The 2019 Graduate Medical Regulations builds on the previous regulations published in 1997 incorporating newer concepts and addressing the changes in health, illness, societal economic and technology changes that have occurred over a decade and a half.

The ability of the new curriculum to help the students achieve their potential will largely depend on converting the intent enshrined in the document into tangible curricular delivery mechanism. We believe that creating processes which will ensure that the curriculum is delivered appropriately to the stakeholder is crucial. We outline a curricular governance process that will enable this.

Glossary of Terms used in this document

Curriculum: a designed learning experience (learning and assessment) which facilitates the learner to achieve the prescribed outcome of a course

Curricular Governance: a process established to design, deliver, evaluate and improve curriculum

Curriculum committee: an institutional body that comprises of faculty and constituted based on the norms prescribed by the MCI that oversees the medical education program as a whole and has responsibility for the overall design, integration, coordination, delivery and improvement of the curriculum

Curricular Governance

Addressing the following questions will help us understand the organisation and processes required in curricular governance

1. Who is accountable for the delivery of the curriculum?
2. Who is responsible for the oversight of the curriculum?

3. Who will support enable and facilitate the faculty to deliver the curriculum?
4. Who will evaluate and provide necessary inputs that will enable course corrections and continuous improvements?

The proposed governance organogram is summarised in figure 1.

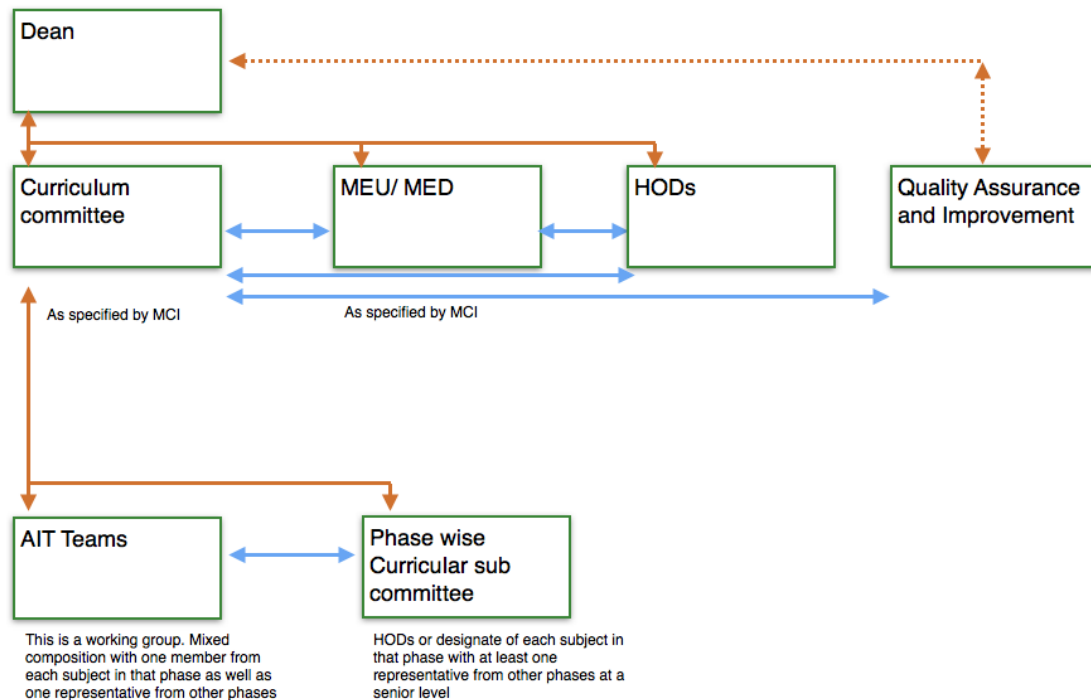


Figure 1. Organogram for curricular governance

Who is accountable for the delivery of the curriculum?

The Dean, Heads of Departments (HOD), faculty and the clinical administrative set up of the institution are responsible for the ultimate delivery of the curriculum. The role of the heads of department in this regard is especially crucial.

The role of the HOD in the process is summarised:

- Responsible for curricular implementation in the department
- Identifies training needs for faculty in the department
- Liaises with other HODs and ensures smooth delivery of the curriculum
- Ensures that departmental responsibility is aligned and integrated topics (AITo) are completed

- Escalates issues to the appropriate teams
- Provides faculty and student support

Who is responsible for the oversight of the curriculum?

The curriculum committee (CC) as constituted in compliance to the terms of reference provided by the MCI (circular date) is responsible. The curriculum committee ensures that the institutional curricular plan and its delivery are aligned to and in accordance to the principles and requirements enshrined in the GMR document.

The role of the curriculum committee in this process is summarised:

- Overall in-charge of the curricular delivery
- Meets at least 6 times a year
- Provides oversight and support of the curricular program
- Creates the timetable with the help of the CSC and AIT and approves them
- Provides necessary authority and support for the work of the curriculum
- Responsible for preparation reports etc as required by the medical council

A mechanism of phase-wise sub-committees and topic specific alignment and integration teams that will help the curriculum committee in its task has been envisaged.

The phase wise **Curriculum Subcommittee (CSC)**: should consist of heads of departments/ key faculty from each specialty teaching in that phase and with representation from members of other phases and reporting to the CC. Its functions are summarised below:

- Responsible for the implementation of the curriculum in each phase
- Meets as often as needed
- Reviews competencies for each phase and converts them into learning objectives
- Works in aligning the curriculum as much as possible and enlisting help from other phases in creating necessary vertical integration and links
- Reduces redundancy across the phase by integrating overlapping teaching elements
- Develops learning and assessment methods for each phase

- g. Prepares the timetable for the phase and presents it to the CC for approval
- h. Collects feedback and provides student support

The Alignment and Integration team (AIT): is a group of faculty that will ensure that a Aligned and Integrated Topic (AITo) is delivered. Each team will have at least one member from each department across phases and is responsible for delivery of the topics. The AIT reports to the curriculum committee. The functions of the AIT include the following:

- a. Responsible for the creating learning and assessment sessions of the Aligned and Integrated Topics (AITo) identified across phases
- b. Each AIT will have a team with adequate representation from the subjects involved in that topic
- c. A team leader from each AIT represents the Aligned and Integrated Topic (AITo) to the CSC and/or CC
- d. Reviews competencies and develops learning objectives for the topic
- e. Assigns learning objectives to each phase and teaching session
- f. Develops learning and assessment methods for the (AITo)
- g. Helps faculty with delivering session appropriately and in a collaborative manner across phases
- h. Collects feedback for the AITo
- i. Provides student support

Who will support, enable and facilitate the faculty to deliver the curriculum?

The Medical Education Unit or Department (MEU) as established in compliance with the terms of reference established by the MCI is responsible for enabling and facilitating the faculty in the delivery of the curriculum. The roles of the MEU in the context of the curricular process include the following :

- a. Provides faculty education and support
- b. Helps develop teaching and assessment methods and trains faculty for each
- c. May be involved in program evaluation and quality improvement of the curriculum
- d. Liaises with the Regional / Nodal centres of the MCI

Who will monitor and provide necessary inputs that will enable course corrections and continuous improvements?

The existing internal quality assurance (IQA) program or mechanism in the medical college is responsible for the reviewing, evaluating and advising authorities of the institution on the performance of the curriculum and improvements required thereof. In institutions where an internal quality assurance process is not established, a Quality Assurance and Insurance QAI program may be set up initially under the aegis of the MEU with a plan to create an autonomous QI program when the institution is ready.

Reporting

In order to ensure appropriate and adequate compliance to the regulations and the curriculum a proactive reporting system is envisaged. This includes reporting of compliance to milestones created training and program evaluations in a half yearly basis. The network of RC and NCs of the MCI will facilitate gathering and processing the data collected. In addition compliance to the curricular requirements will be reviewed during inspections of the institution by the Medical Council of India.

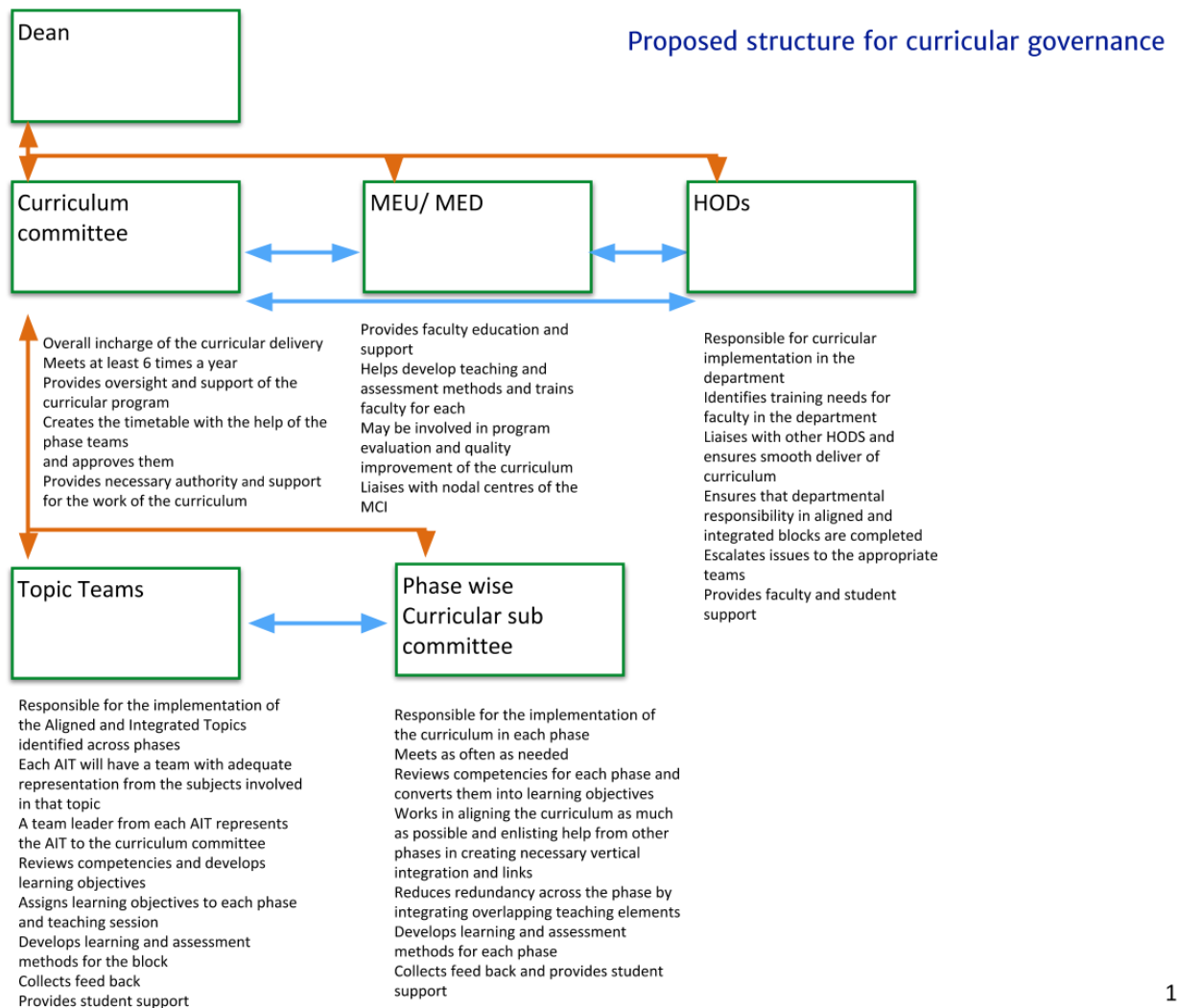
Support

Ongoing support for the curriculum will be provided by the MCI through its national experts nodal and regional centres. A library of resources, videos, case studies, best practices etc will be available for institutions through the website. A collaborative support network of institutions and teachers will also be created that will allow institutions to work and grow together and help fulfill the aspirations of the new regulations.

ROLL OUT PLAN OF COMPETENCY BASED UG CURRICULUM

Milestone	Dates of Workshop	Location of workshop
First CISP at MCI for Conveners & Co-Conveners of Regional & Nodal Centres at Kerala, Tamil Nadu, Puducherry, Karnataka, Andhra Pradesh, Madhya Pradesh & UP	January 16-17, 2019	Medical Council of India
Second CISP at MCI for Conveners & Co-Conveners of Regional & Nodal Centres at Maharashtra, Odisha, Punjab, Assam, Uttarakhand & Gujarat	January 23-24, 2019	Medical Council of India
CISP training program for in-house faculty of department of Medical Education at Nodal & Regional Centres	To be completed by February 7, 2019	Nodal & Regional Centre ME Departments
CISP training program for Curriculum Committee members of colleges allotted to each Nodal & Regional Centre	From second week of February, 2019 to end of April, 2019	
CISP workshops to train medical college faculty supervised by Observer from respective Nodal & Regional Centres	May 2019 (or even earlier as per schedule fixed by medical colleges in consultation with corresponding Nodal or Regional centres) – a continuing process until all college faculty are trained.	Medical colleges
Submission of first compliance report	March, 2019 for in-house workshops	Nodal & Regional centre faculty in charge of CISP
Submission of second compliance report	March 2019 – May 2019	
Submission of third compliance report	May 2019 onwards	By Observer to the workshop through Nodal & Regional centre faculty- in - charge of CISP
Completion of skill labs and other requisite infrastructure	March 2019 to December 2019	Dean of institution

Figure 2 : Governance structure for curriculum with functions and responsibilities



Further Reading

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Foundation course

Introduction:

Medical education today is characterized by vast knowledge base, from cutting-edge biomedical science to the professional artistry, and the high level of technical proficiency that students must acquire for practice. Clinical education, recognized as very strenuous training, involves far more than imparting students with scientific knowledge and technical skills.

The clinical work and the other tasks of physicians are social practices and therefore physicians need to be prepared to work in relation with their patients, other professionals and nonprofessionals in varied settings like clinics, hospitals and communities. Care of patients is an interpersonal pursuit, involving interactions between clinicians and patients, which even in a simple situation involves many people, let alone in more complex settings where a number of specialists from different fields are engaged.

The selection of students to medical colleges in India is based on merit of the candidate at competitive entrance examinations. The selection criteria do not take care of non-cognitive abilities of the students. The entry level students are in the age group of 17-19 years. At this stage of the transition from high school to a professional course, these students may also face possible maladjustment to hostel life and food, and instruction in foreign language. Many students who might have pursued rote learning in high school find it difficult to cope with the different learning environment in a medical college.

Therefore, it is necessary to develop and implement students' orientation program at the entry level of MBBS program to acclimatize them to campus environment, familiarize with teaching programs, help adapt to the academic challenges as they move from high school into undergraduate programs. Such structured foundation course would help students coming from a very different learning environment to cope with the vast body of knowledge and skills required in the dynamic and rapidly changing health care system. Besides the development of essential knowledge and skills, the emphasis on training the undergraduate students in techniques of learning will motivate them to develop the habits of self-directed learning.

The overall objective of foundation course would be to sensitize the learners with essential knowledge and skills which will lay a sound foundation for their pursuit of learning across the subjects in MBBS course and later on a career in medicine. Foundation course at entry level and the longitudinal program envisaged GMR 2017 in AETCOM module will help students acquire necessary non-cognitive competencies.

Relevant Extract from GMR

New teaching / learning elements

9.1. Foundation Course

Goal: The goal of the Foundation Course is to prepare a learner to study Medicine effectively. It will be of one month duration after admission (see Table)

9.1.1 **Objectives:** The objectives are to:

(a) Orient the learner to:

- (i) The medical profession and the physician's role in society
- (ii) The MBBS programme
- (iii) Alternate health systems in the country and history of medicine
- (iv) Medical ethics, attitudes and professionalism
- (v) Health care system and its delivery
- (vi) National health priorities and policies
- (vii) Universal precautions and vaccinations
- (viii) Patient safety and biohazard safety
- (ix) Principles of primary care (general and community based care)
- (x) The academic ambience

(b) Enable the learner to acquire enhanced skills in:

- (i) Language
- (ii) Interpersonal relationships
- (iii) Communication
- (iv) Learning including self-directed learning
- (v) Time management
- (vi) Stress management
- (vii) Use of information technology

(c) Train the learner to provide:

- (i) First-aid
- (ii) Basic life support

- 9.1.2 In addition to the above, learners may be enrolled in one of the following programmes which will be run concurrently:
- (a) Local language programme
 - (b) English language programme
 - (c) Computer skills
 - (d) These may be done in the last two hours of the day for the duration of the Foundation Course.
- 9.1.3 These sessions must be as interactive as possible.
- 9.1.4 Sports (to be used through the Foundation Course as protected 04 hours / week).
- 9.1.5 Leisure and extracurricular activity (to be used through the Foundation Course as protected 02 hours per week).
- 9.1.6 Institutions shall develop learning modules and identify the appropriate resource persons for their delivery.
- 9.1.7 The time committed for the Foundation Course may not be used for any other curricular activity.
- 9.1.8 The Foundation Course will have compulsory 75% attendance. This will be certified by the Dean of the college.
- 9.1.9 The Foundation Course will be organized by the Coordinator appointed by the Dean of the college and will be under supervision of the heads of the preclinical departments.
- 9.1.10 Every college must arrange for a meeting with parents and their wards.

Table : Foundation Course (one month)

Subjects/ Contents	Teaching hours	Total hours
Orientation ¹	30	30
Skills Module ²	35	35
Field visit to community health center	8	8
Professional Development including ethics		40
Sports and Extracurricular activities	22	22
Enhancement of language/ computer skills ³	40	40
		175

1. Orientation course will be completed as single block in first week and will contain elements outlined in 9.1.
2. Skills modules will contain elements outlined in 9.1
3. Based on perceived need of students, may choose language enhancement (English or local spoken or both) and computer skills. This should be provided longitudinally through the duration of the Foundation Course.
- 4. Teaching of Foundation Course will be in preclinical departments.**

Intent

To provide a bridge course for students from different boards, language of instructions, backgrounds and cultures and adequately prepare them for learning and a career in medicine

Elements and components of the program

- 1) Doctor's role in Society
 - a) Expectations of society from doctors
 - b) Expectations of patients from doctors
 - c) Expectation of the profession from its members
 - d) Roles and responsibilities of doctors
 - e) Gender sensitivity
- 2) What can the student expect
 - a) From the society and nation
 - b) From the institution
 - c) From teachers
 - d) From peers and colleagues
 - e) From patients
- 3) Orientation of the student to:
 - a) Rules and regulation
 - b) Facilities
 - c) Faculty
 - d) Facility visits – library, hostels , sports ground, common rooms
 - e) Library visits and facility orientation
 - f) Hospital visit
- 4) Overview of the MBBS program
 - a) Curriculum description
 - b) Career pathways & personal growth
 - c) Role at various levels of health care delivery system
 - d) Skill requirements and certifications
 - e) Examinations
 - f) University rules regarding examinations and attendance
- 5) Learning skills
 - a) Learning pedagogy
 - b) Self directed learning
 - c) Learning strategies
 - d) Community based learning

- e) Peer assisted learning
 - f) Self directed learning
 - g) Use of online resources
 - h) Group learning
 - i) Assessment driven learning
 - j) Simulation based learning
 - k) Learning from patients and other members of the health care team
- 6) Language and Communication skills
 - 7) Group dynamics
 - 8) Working within a health care team
 - 9) Documentation and the medical record
 - 10) Interpersonal communication
 - 11) Relating to patients experience of the disease
 - 12) Communication with patients and families
 - 13) Need based access to learning English and/ or local language of communication
 - 14) Professionalism attitude and ethical behaviour
 - a) Concept of professionalism and ethics
 - b) Consequences of unethical and unprofessional behavior
 - c) Value of integrity honesty and respect during interaction with peers, seniors and faculty other health care workers and patients
 - d) Functioning as part of a health care team
 - 15) Safety
 - a) Handwashing
 - b) Needle /scalpel stick injuries
 - c) Immunisation requirements of health care professionals
 - d) Concept of biosafety
 - e) Handling biomaterial/ biowaste management
 - 16) Orientation to community
 - a) Visit a community health center
 - b) Introduction to health care workers and their role
 - c) Introduction to and interaction with patients
 - 17) Skills program

- a) BLS
- b) First aid

18) Introduction to alternate health care systems and their relevance and relationship to the practice of modern medicine

Curricular governance and evaluation of the program

(Person responsible, evaluation periodicity, methods, reporting)

The program will be owned and conducted by the pre-clinical departments with appropriate input and faculty support by other departments

Responsibilities of Dean of the medical college:

- a. To head a committee for Foundation Course implementation with one pre-clinical HOD as Convener and the other three and MEU Coordinator / co-Coordinator as members
- b. To allocate a venue for the foundation course (preferably other than the Lecture class rooms)
- c. To allocate the resources for the conduct of the foundation course (including those related to community visits, external resource persons etc.)
- d. To conduct at least two meetings with Curriculum Committee and the committee mentioned above in the month preceding the Foundation Course
- e. To arrange the meeting with parents and faculty.

Responsibilities of the Curriculum Committee

- a. To schedule the sessions for one month and allocate the sessions to the resource persons (including external resource persons from outside the college, if necessary)
- b. To monitor the smooth conduct of the program
- c. To coordinate with the administration and clinical faculty
- d. To monitor and submit reports to the Dean

Responsibilities of the MEU

- a. To arrange the sensitisation programs for all faculty members (including the Dean & HODs)
- b. To ensure the coordination between the above two committees
- c. To train and orient the resource persons

- d. To collect the reports and coordinate with NC / RC.
- e. To ensure that at least one MEU faculty should be present in all sessions.

Evaluation: Program effectiveness questionnaire from faculty and students

Reporting: The Curriculum Committee will submit the schedule and report with inputs from students, resource persons, MEU faculty and the MEU coordinator shall forward the same to NC/RC within two weeks of the last day of the Foundation Course. The NC/RC Convener shall forward a consolidated report in the prescribed proforma to the MCI within four weeks.

Attitude, Ethics & Communication (AETCOM)

Introduction

In order to be able to function appropriately ethically and effectively in her/his roles as clinician, leader and member of the health care team and system, communicator, lifelong learner and as a professional, there need to be a structured training program. Medical Council of India has proposed new teaching learning approaches including a structured longitudinal program on attitude, communication and ethics.

Role modelling and mentoring associated with classical approach to professional apprenticeship has long been a powerful tool. This approach alone is no longer sufficient for the development of a medical professional. The domains of attitude and communications with emphasis on ethics therefore need to be taught directly and explicitly throughout the undergraduate curriculum. The two major aspects of teaching professionalism include explicit teaching of cognitive base and stage appropriate opportunities for experiential learning and reflection throughout the curriculum.

AETCOM module has been prepared as a guide to facilitate institutions and faculty in implementing a longitudinal program that will help students acquire necessary competence in the attitudinal, ethical and communication domains. It offers framework of competencies that students must achieve. It also offers approaches to teaching learning methods. However, it is a suggested format and institutions can develop their own approaches to impart these competencies.

Objectives of the document:

To facilitate institutions and faculty in implementing a longitudinal program that will help students acquire necessary competence in the attitude, ethics and communication domains. This shall enable the graduate to function effectively in the four roles of leader and member of the health care team, communicator, life-long learner and professional as envisaged in the revised Graduate Medical Education Regulations.

Curricular Element or Program Addressed:

Professional development including Attitude, Ethics & Communication (AETCOM)

Relevant Extract from GMR:

2. Indian Medical Graduate Training Programme

The undergraduate medical education programme is designed with a goal to create an “Indian Medical Graduate” (IMG) possessing requisite knowledge, skills, attitudes, values and responsiveness, so that she or he may function appropriately and effectively as a physician of first contact of the community while being globally relevant.

2.3. Goals and Roles for the Learner

In order to fulfil the goal of the IMG training programme, the medical graduate must be able to function in the following roles appropriately and effectively:-

2.3.1. Clinician who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.

2.3.2. Leader and member of the health care team and system with capabilities to collect analyze, synthesize and communicate health data appropriately.

2.3.3. Communicator with patients, families, colleagues and community.

2.3.4. Lifelong learner committed to continuous improvement of skills and knowledge.

2.3.5. Professional, who is committed to excellence, is ethical, responsive and accountable to patients, community and profession.

7.4.1 **Pre-Clinical Phase** - Professional development including Attitude, Ethics & Communication (AETCOM) module

7.4.2 **Para-clinical phase** - Professional development including Attitude, Ethics & Communication (AETCOM) module

7.4.3 **Clinical Phase** - Professional development including Attitude, Ethics & Communication (AETCOM) module

9.4 Professional Development including Attitude, Ethics and Communication Module (AETCOM).

Objectives of the programme: At the end of the programme, the learner must demonstrate ability to:

- (a) understand and apply principles of bioethics and law as they apply to medical practice and research,
- (b) understand and apply the principles of clinical reasoning as they apply to the care of the patients,
- (c) understand and apply the principles of system based care as they relate to the care of the patient,
- (d) understand and apply empathy and other human values to the care of the patient,
- (e) communicate effectively with patients, families, colleagues and other health care professionals,
- (f) understand the strengths and limitations of alternative systems of medicine,
- (g) respond to events and issues in a professional, considerate and humane fashion,
- (h) translate learning from the humanities in order to further his / her professional and personal growth

Teaching Learning Methods recommended

Guidelines for Case Discussion

A hybrid problem-oriented approach is one of the most effective ways for students to explore the various facets of “real life issues” that will confront them in their careers. In addition to problem solving skills, case discussions promote collaborative learning, team work, reflection and self-directed learning. The cases presented in the AETCOM booklet represent competencies that lend themselves best to this form of learning.

1. Two or more learning sessions are recommended for each session with ample time for self-directed learning and other learning activities between each session.
2. A case is introduced into a small group and the facilitator facilitates a small group discussion where,
 - a. initial reactions of the group to the case is obtained,
 - b. the underlying ethical, legal and societal principles of the case are elicited,

- c. learning objectives for the case are developed,
- d. Learning tasks are assigned for members of the learning groups,
- e. Learning resources are identified.

The suggested location for such a session is a small group discussion area which requires a small table with seating for 8 - 10 students. Suggested duration for such a session is 1 hour.

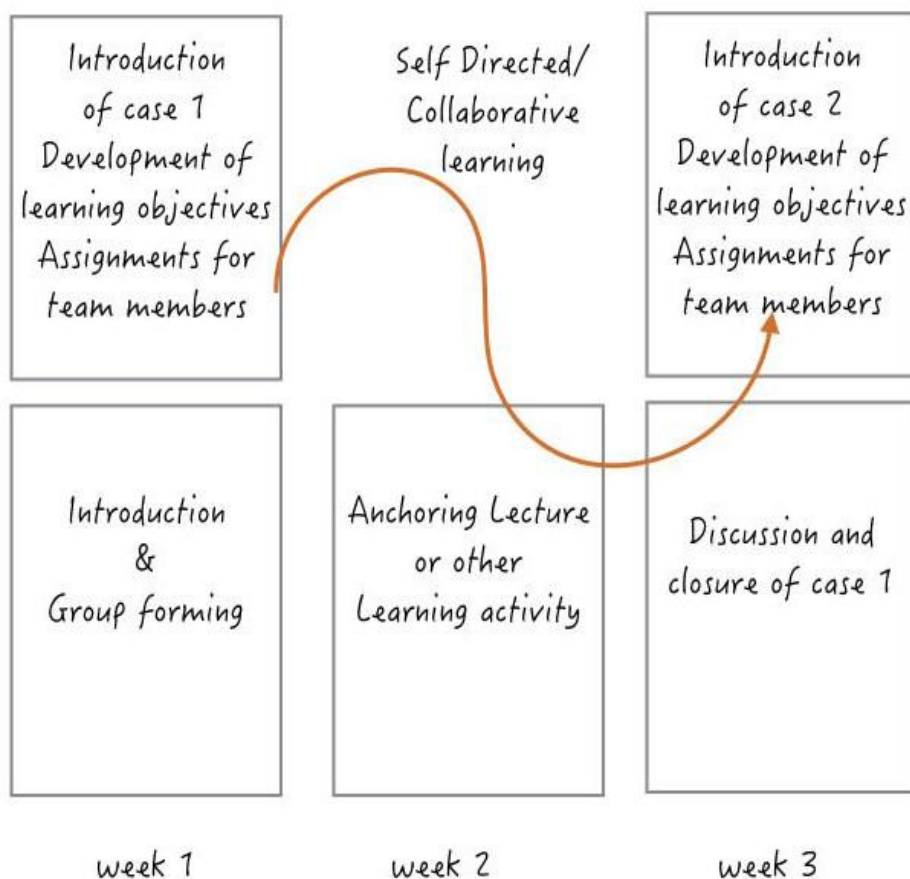
A board with chalk or marker is also required.

3. Learning occurs in between sessions by the learners through following:

- Self-directed learning by study of identified learning resources,
- Self-directed learning through study of online learning resources,
- Identification of legal, ethical and social precedents for the given settings,
- Obtaining opinion from seniors in the profession on their impressions on the setting

4. Reinforcement of the fundamental concepts underlying the case can be done through a large group learning session (lecture or equivalent) in between the small group sessions.

5. In the second session, the small group discussion is focussed on closure of the case (or the part of the case) for which learning objectives were identified for in the first session. The facilitators may guide the discussion based on the ethical, legal, societal and communication aspects of the case. The group discusses the case, based on the learning done in between the session and provides suggestions and alternatives on the approach for doctors to follow. It must be reiterated that there may not be one correct way to resolve a case. The approach will be to allow students to reflect, make a choice and defend their choice, based on their values and learning.



The Hybrid PBL model suggested for ATCOM Cases

Student narrative

The student narrative is a learning method that focuses on the following skills:

- a. Elicit, observe and record data,
- b. Reflect on the data at a higher level of thinking and derive opinions and conclusions,
- c. Communicate the observations and conclusions in a written and verbal form and expand on and defend the conclusions with colleagues and teachers,
- d. Form new experiences and conclusions based on this discussion.

Communication Skill:

Doctor patient encounters

1. Building the doctor patient relationship - Body Language, Introduction.

2. Opening the discussion – Gaining Confidence.
3. Gathering information – Re alignment
4. Understanding the patient’s perspective – Physical / Emotional / Social - Pts perspective
5. Sharing information – Medical Advice.
6. Reaching agreement on problems and plans – Discuss treatment options.
7. Providing closure – Future course / Follow up

Breaking a bad news: Bad News: Definition: “Any information which adversely and seriously affects an individual’s view of his or her future”

SPIKES- Six- Step Protocol for Delivering Bad News

- Step 1: **S-** Setting Up The Interview
- Step 2: **P-** Assessing The Patient’s Perception
- Step 3: **I-** Obtaining The Patient’s Invitation
- Step 4: **K-** Giving Knowledge And Information To The Patient
- Step 5: **E-** Addressing The Patient’s Emotions With Empathic Responses
- Step 6: **S-** Strategy and Summary

Medicine and humanities

Curriculum

Different approaches would be used to help students to understand the broader socio-economic framework and cultural context within which health care is delivered. Students would also learn about the humanities through art, literature and cinema.

Objective

To provide knowledge, understanding and critical perspective in areas outside conventional biomedicine that are required for a doctor. The training should offer the ability to reflect on problems and understand the milieu of practice in India.

Suggested themes may include:

- The history and culture of diseases
- The history of modern medicine in the western world and in India.
- The political economy of medicine in India
- Representing the doctor. A study of selected fiction, artworks and films.
- Questions of gender, caste, minority, sexuality

- Patient issues
- Death and Dying in India
- The art of practice
- Sociology
- Family structure
- Socio-economic aspects, poverty
- Health seeking behaviour
- Health beliefs

Methodology

- a) Sociology training through practical exercises, experiential learning and discussion, local art forms etc..
- b) Experience of urban and village life
- c) A group of students adopts a set of families. Each student has responsibility for one family.
- d) Students conduct a set of surveys regarding family structure, socio-economic status, common health problems, and health seeking behaviour and health beliefs
- e) Students are involved in health education and health clinics

This may be suitably modified according to the facilities of each medical college.

Assessment of skills related to Attitude, Ethics and Communication

Assessment is a vital component of competency based education. In addition to making the pass/fail decisions, a very important role of assessment is to provide feedback to the learner and help him/her to improve learning. The assessment in AETCOM module has been designed with this purpose. The teachers should use this opportunity to observe the performance and provide feedback based on their observations. In case a student has demonstrated a performance, which is considered below expectation, corrective action including counseling should be initiated. Many of the tools in this module may appear subjective but coupled with the experience of the assessor, they will serve a very useful purpose

List of resources :

Must read :

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2. Jonathan Martin, Margaret Lloyd and Surinder Singh. Professional attitudes: can they be taught and assessed in medical education. *Clinical Medicine* Vol 2 No 3 May/June 2002 217
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Humanities

Music and Healing

Background

Music is an integral part of human life from birth to death, through happiness and joy. For many of us it is part of our wellness quotient. Does music heal? Does it help patients cope with illness? Does it improve outcomes? Should medicine embrace music as part of its armamentarium? This module allows the learner to explore the interface between music health and healing

Competency addressed

The learner must explore and appreciate the relationship between music and healing and demonstrate an understanding as to how music is used as an adjunct to the healing process

Learning Session

Year of Study: 1st year

Hours: 8 hours

Exploratory session : 2 hours

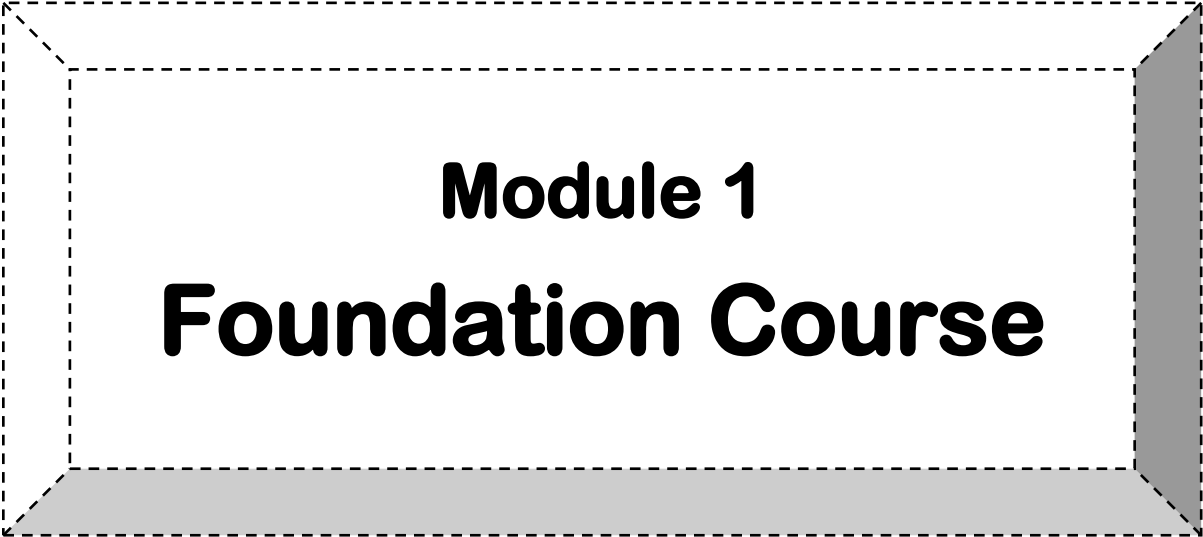
Self Directed Learning: 4 hours

Research / Task / Report

Discussion and closure: 2 hours

Description:

1. An exploratory session is created where either in small groups or an interactive large group students are allowed to explore their personal relationship with music. Discuss particularly about music during time of illness and depression. Faculty /Clinicians share patient related experiences. If there is access to live experts if not, a curated selection of healing music may be played. Regional music traditions linked to healing can be explored. If available, a documentary such as *Alive Inside* can be screened. The task as enumerated in item 2 is given to individuals or groups
2. Students individually or in groups are asked to research evidentiary and other links to music and healing. They may be requested to talk to local musicians, experts, clinicians and patients and compile a narrative. Audio samples of local music traditions used to heal can be part of the report.
3. Discussion ad closure: A closure session where students share their reflection based on their tasks and learnings and their implications.



Module 1
Foundation Course



MEDICAL COUNCIL OF INDIA

COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE

Knows Knows how Shows Shows how Performs

Observe

Demonstrate

Enumerate

Assist

Counsel

Describe

Prescribe

Analyse

Integrate

Guide

Communicate

Correlate

Interpret

Module 1

Critique

Foundation Course

Collaborate

Clinician

Communicator

Team Leader

Professional

Lifelong Learner

Knowledge

Skills

Attitude

Values

Responsiveness

Communication

Curriculum Implementation Support Program

**Foundation Course for the Undergraduate
Medical Education Program**

2019



**Medical Council of India
Pocket-14, Sector-8, Dwarka,
New Delhi 110 077**

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FOREWORD

Medical education and educators have the responsibility of training the custodians of the health of the nation. The MBBS program is the foundation of the health delivery system in the country creating health care providers who need to provide not only adequate, appropriate and cost effective care but also need to be leaders of their community. Through the program it is expected that students will be able to fulfill their professional and personal goals and aspirations in addition to the expectations of the profession, society and nation. The course can be demanding and requires the learner to respond to the challenges of continued learning and improvement. Besides acquisition of new skills, learner is required to provide leadership in challenging situations and demonstrate exemplary professional and humanistic attributes. Medical students come from varied backgrounds and require a bridge that will transition from school to a professional course.

The Board of Governors in supersession of Medical Council of India has therefore created a Foundation Course that will not only serve as a bridge for the student into the MBBS program but will also orient the student to the knowledge, skills and attitude required of him or her during the program. The Foundation Course is envisaged to be a month long program with continued support provided through the year for students to acquire language, communication and computer skills. Particular emphasis on professional and ethical behaviour is placed in the Foundation Course; this dovetails into the AETCOM module - one of the flagship programs of the MBBS curriculum.

This booklet has been developed by experts and is meant to be used as a program guide for the Foundation Course. It outlines the outcomes that are intended to be achieved; it also incorporates examples of the Foundation Course program derived from best practices from around the country. Institutions are encouraged to develop their own Foundation Course that addresses local needs and brings out the institutional flavour while aligning the whole program to the outcomes identified in the booklet. The Medical Council of India also welcomes institutions to share their learning feedback and best practices that will enhance the value and structure of the program in the coming years.

The Council is grateful to the experts who have developed this booklet for their time and effort. Appreciation is also due to the Academic Cell and the members of expert group headed by Dr. Avinash Supe under whose guidance the course and the competency based curriculum has been developed and is being progressively rolled out in the country.

(Dr. V. K. Paul)



डॉ. राकेश कुमार वत्स

महासचिव

Dr. R.K. Vats

Secretary General



सत्यमेव जयते

भारतीय आयुर्विज्ञान परिषद

के अधिक्रमण में शासी बोर्ड

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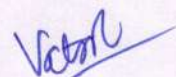
Foreword



India has the unique distinction of having the largest number of medical schools since it has taken the responsibility to create a large pool of health educators who would be responsible to train the young Indian Medical Graduate joining the undergraduate medical education program. The MBBS program is the foundation of the health delivery system in the country, creating health care providers who need to provide not only adequate, appropriate and cost effective health care but also need to be leaders of their community, in due course. Medical students in India come from diverse backgrounds in terms of geography, culture, language, economy, social construct, medium of instruction and education Boards. The MBBS course is a highly challenging program which prepares the student for a lifetime of altruistic care, continued learning, discipline, professional and ethical behavior and respect for human interactions, systems and processes. It is therefore necessary that a smooth transition of the high school student to this challenging learning stream is ensured and to achieve this, a Foundation Course at the beginning of the MBBS program was considered necessary.

This booklet has been developed by Council-nominated experts and is meant to be used as a program guide for the Foundation Course; institutions are encouraged to develop their own format of the Foundation Course that addresses local needs while aligning the whole program to the outcomes identified in the booklet. The Foundation Course is the forerunner to the roll out of the competency based UG curriculum across the country under the aegis of the Medical Council of India & Board of Governors.

The Council is grateful to the Expert group who have developed this booklet for their valuable time, knowledge, expertise and effort ably supported by the Academic Cell of the Council.


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Curriculum Implementation Support Program

Module – 1

FOUNDATION COURSE

FOUNDATION COURSE

Objective of the document

The objective of this document is to facilitate institutions and faculty in implementing a **Foundation Course** of one-month duration at the beginning of the MBBS course that will sensitise the fresh medical student with the required knowledge and skills that will assist him/her in acclimatising to the new professional environment which would be his/her milieu for a life-long career in the medical profession. The Foundation Course will also provide a sound foundation for learning in the MBBS course and later in their professional career. While the institutions are expected to abide by the general guidelines, local changes can be made depending on the context and requirements.

1. Glossary of terms used in the document

Orientation: Refers to the awareness created in new students with respect to place (learning environment and facility), time, teaching schedules and timetables, processes (Rules, Regulations, policies and procedures), personnel (faculty, staff, and mentors), patients and their relatives.

Skills Module: Refers to basic skills that are considered important for all health care personnel who deal with patients and requires students to be trained in prior to entering patient care areas.

Enhancement skills: Refers to those skills which are needed to enable students from diverse backgrounds (including different Boards, language of instruction, culture and varied degrees of technological exposure) to appreciate and accommodate the similarities and differences in medical practice and to feel at par with each other.

Sports and extra-curricular activities: Refers to sports and extra - curricular activities permitted within the time schedule.

Professionalism and ethics: Professionalism defines a set of values and behaviour that build the trust that a patient has in his/ her doctor. Ethics are principles that govern the behaviour of doctors. Professional competence, effective communication and ethics are the three founding principles of Professionalism.

2. Introduction

Medical education in India requires training in a wide spectrum of domains that involves exposure to human interactions and interpersonal relationships in various settings including hospital, community, clinics etc. The training is intense and demands great commitment, resilience and lifelong learning. Students enter a new environment in medical college at around 17 years of age directly from school which can be challenging. Therefore, it is desirable to create a period of acclimatisation and familiarization to the new environment. This would include an introduction to the course structure, learning methods, technology usage, and peer interactions which would facilitate their smooth transition from high school to medical college.

This is proposed to be achieved through a dedicated one month exclusive “Foundation Course”, at the beginning of the MBBS course, to orient and sensitize the student to the various identified areas. Many of these identified areas will need to be followed up by more focused outcome-based sessions at various stages in the MBBS course. This will be achieved through activities/small courses integrated throughout the course which will be like the thread running through a garland. At appropriate stages throughout the course, emphasis will be laid on the various essential roles of the “Indian Medical Graduate”.

3. Purpose

The purpose of the Foundation Course include:

- a) Orienting the students to all aspects of the medical college environment.
- b) Equipping them with certain basic, but important, skills required for patient care and enhancing their communication, language, computer and learning skills.
- c) Providing opportunity for peer and faculty interactions and an overall sensitisation to the various learning methodologies.

4. Context from proposed GMER 2019 (Graduate Medical Education Regulations)

9.1. Foundation Course

Goal: The goal of the Foundation Course is to prepare a learner to study Medicine effectively. It will be of one-month duration after admission (see Table 1).

9.1.1 **Objectives:** The objectives are to:

(i) Orient the learner to:

- a. The medical profession and the physician's role in society
- b. The MBBS programme
- c. Alternate health systems in the country and history of medicine
- d. Medical ethics, attitudes and professionalism
- e. Health care system and its delivery
- f. National health priorities and policies
- g. Universal precautions and vaccinations
- h. Patient safety and biohazard safety
- i. Principles of primary care (general and community-based care)
- j. The academic ambience

(ii) Enable the learner to acquire enhanced skills in:

- a. Language
- b. Interpersonal relationships
- c. Communication
- d. Learning including self-directed learning
- e. Time management
- f. Stress management
- g. Use of information technology

(iii) Train the learner to provide:

- a. First-aid
- b. Basic life support

9.1.2 In addition to the above, learners may be enrolled in one of the following programmes which will be run concurrently:

- (i) Local language programme
- (ii) English language programme

(iii) Computer skills

These may be done in the last hours of the day for the duration of the Foundation Course.

9.1.3 These sessions must be as interactive as possible.

5. Major Components

The major components of the Foundation Course include:

- **Orientation Program:** This includes orienting students to all the components mentioned in GMER 9.1 and should be completed as one block in the first week.
- **Skills Module (Basic):** This involves skill sessions such as Basic Life Support, First Aid, Universal precautions and biomedical waste and safety management that students need to be trained prior to entering the patient care areas.
- **Field visit to Community and Primary Health Centre:** These visits provide orientation to the care delivery through community and primary health centres, and include interaction with health care workers, patients and their families.
- **Professional development including Ethics:** This is an introduction to the concept of Professionalism and Ethics. This component will provide students with understanding that clinical competence, communication skills and sound ethical principles are the foundation of professionalism. It will also provide understanding of the consequences of unethical and unprofessional behaviour, value of honesty, integrity and respect in all interactions. Professional attributes such as accountability, altruism, pursuit of excellence, empathy, compassion and humanism will be addressed. It should inculcate respect and sensitivity for gender, background, culture, regional and language diversities. It should also include respect towards the differently abled persons. It introduces the students to the basic concept of compassionate care and functioning as a part of a health care team. It sensitises students to “learning” as a behaviour and to the appropriate methods of learning.

Orientation to Professionalism and Ethics will continue as the AETCOM module after the first month of the MBBS course and throughout the first year, with reinforcement of the various components introduced.

- **Sports and Extracurricular activities:** These have been included, in order to demonstrate the importance of work-life balance in a demanding profession, and provide an opportunity for students to have compulsory physical activity and to showcase their talents. The Foundation Course should have compulsory 4 hours

per week for sports and 2 hours per week for extracurricular activities, adding up to 22 hours.

- **Enhancement of Language / Computer skills / Learning Skills:** These are sessions to provide opportunity for the students from diverse background and language competence to undergo training for speaking and writing English, fluency in local language and basic computer skills. The students should be sensitized to various learning methodologies such as small group discussions, skills lab, simulations, documentation and concept of Self-Directed learning.

Structure of the program for students

Table.1

Subjects/ Contents	Total Teaching hours
Orientation ¹	30
Skills Module ²	35
Field visit to Community Health Centre	8
Professional Development including ethics	40
Sports and Extracurricular activities	22
Enhancement of language/ computer skills ³	40
Total teaching hours	175

1. Orientation course will be completed as single block in first week and will contain elements outlined in the section 9.1.1 of the GMR
2. Skills modules will contain elements outlined in the section 9.1.1 of the GMR
3. Based on perceived needs the students may choose any or both of language enhancements (English or local spoken or both) and computer skills. This should be available longitudinally throughout the duration of the Foundation Course and afterwards.

Foundation Course will be organized by co-ordinator appointed by Dean of the college and will be under supervision by the heads of preclinical departments.

Foundation Course Modules

1. Orientation Module	Total hours: 30
1A. Orientation Module: Introduction to institution / campus / facilities	
1B. Orientation Module: Role of doctors in the society	
1C. Orientation Module: History of Medicine and alternate systems	
1D. Orientation Module: IMG roles / overview MBBS curriculum various career pathways	
1E. Orientation Module : Principles of family practice	
2. Skills Module:	Total hours: 35
2A.Skills Module: First Aid	
2B.Skills Module: BLS	
2C.Skills Module: Universal precautions	
2D.Skills Module: Waste management	
2E.Skills Module: Immunization	
2F.Skills Module: Documentation	
3. Community orientation module	Total hours: 8
3A. Community Orientation Module: National Health goals and policies/ health Care systems/ community health	
3B. Community Orientation Module: Interactions with patients and families, Communities.	
4. Professional Development and Ethics Module (P&E)	Total hours: 40
4A. (P&E): Concept of Professionalism and Ethics	
4B. (P&E): White coat Ceremony	
4C. (P&E): Professional behaviour and altruistic behaviour	
4D. (P&E): Working in a health care team	
4E. (P&E): Disability competencies	
4F. (P&E): Cultural competence	
4G. (P&E): Stress management	
4H. (P&E): Time management	
4I. (P&E): Interpersonal relationship	
4J. (P&E): Learning	
5. Enhancement of Language and Computer Skills Module	Total hours:40
5A.Enhancement of Language and Computer Skills Module: Communication	
5B.Enhancement of Language and Computer Skills Module: Local Language training	
5C. Enhancement of Language and Computer Skills Module: English Language training	
5D.Enhancement of Language and Computer Skills Module: Computer Skills training	
6. Sports and extracurricular activities:	Total hours: 22

Sports should be for a mandatory 4 hours per week and extra-curricular activities 2 hours per week, subject to a total of 22 hours.

6. Learning outcomes

Code	COMPETENCY The student should be able to:	Domain	K/KH/ SH/P
1.	Topic : ORIENTATION		
FC 1.1	Demonstrate understanding of the role of doctors in the society and their impact	A	KH
FC 1.2	Demonstrate understanding of the Roles of an Indian Medical Graduate and relate it to the societal impact	A	KH
FC 1.3	Discuss and appreciate the expectations of the students from the Nation, society, Institution, peers, colleagues and patients and vice versa	A	KH
FC 1.4	Demonstrate understanding of the rules and regulations of the institution	A	SH
FC 1.5	Orient themselves to the college campus, facilities, faculty, administrative structure, support systems and processes of the institution	A	KH
FC 1.6	Discuss the various career pathways and opportunities for personal growth	A	KH
FC 1.7	Demonstrate understanding of the overview of MBBS curriculum, its structure and outcomes and its relation to the career pathways	K	KH
FC 1.8	Demonstrate understanding the role of physician at various levels of Health care delivery	K	KH
FC 1.9	Discuss the principles of family practice	K	KH
FC 1.10	Demonstrate awareness of the History of Medicine and alternate systems of Medicine	K	K
2	Topic : Skills		
FC 2.1	Perform Basic Life support in Skills lab	S	SH
FC 2.2	Perform First Aid in a simulated environment	S	SH
FC 2.3	Follow bio-safety and universal precautions	S	SH
FC 2.4	Demonstrate handling and safe disposal of Biohazardous materials in a simulated environment	S	SH
FC 2.5	Demonstrate proper hand washing and use of personal protective equipment	S	SH

FC 2.6	Demonstrate appropriate response to needle stick injuries	S	SH
FC 2.7	Demonstrate Biomedical Waste segregation (BMW), observe and explain the process of management of BMW in accordance with National Regulations	S	SH
FC 2.8	Discuss the Immunization requirements of Health care professionals	K	KH
FC 2.9	Demonstrate awareness of significance of documentation in patient care and the proper method of documentation	S	SH
3	Community Orientation and field visits		
FC 3.1	Demonstrate understanding of the National Health Goals and Policies	K	KH
FC 3.2	Discuss the national health scenario, demographic, socio-cultural and epidemiological issues	K	KH
FC 3.3	Demonstrate understanding of the health care systems in India with reference to primary, secondary and tertiary level care	K	KH
FC 3.4	Discuss the basic principles of community health and its impact on health and disease	S	SH
FC 3.5	Demonstrate understanding of the structure and functioning of the community health center	K	KH
FC 3.6	Demonstrate ability to obtain patient experiences through patient and family interactions and relate these experiences to impact of environment and diseases.	S	SH
4	Professional Development including Ethics		
FC 4.1	Demonstrate understanding of the concept of Professionalism and ethics among health care professionals and discuss the consequences of unprofessional and unethical behavior	S	KH
FC 4.2	Demonstrate understanding that compassion, altruism, integrity, duty, responsibility and trust are the core values that defines the nature of the physician's work	K	KH
FC 4.3	Discuss the value, honesty and respect during interaction with peers, seniors, faculty, other health care workers and patients	S	KH

FC 4.4	Discuss the significance of working in a health care team	S	KH
FC 4.5	Discuss disability competencies	K	KH
FC 4.6	Demonstrate understanding and respect of cultural diversities and interact with those with different cultural values	K/A	KH
FC 4.7	Discuss the significance and methods of stress management and risk taking behavior.	K	KH
FC 4.8	Understand the role of Yoga and meditation in personal health	S	S
FC 4.9	Discuss the significance and appropriate ways of Time management	K	KH
FC 4.10	Demonstrate understanding of importance of interpersonal relationship while working in a health care team	S	KH
FC 4.11	Understand the role of mentoring	S	KH
FC 4.12	Demonstrates understanding of the process of group learning and group dynamics	S	KH
FC 4.13	Comprehend the learning pedagogy and its role in learning skills	S	KH
FC 4.14	Demonstrates understanding of different methods of self-directed learning	S	KH
FC 4.15	Understand collaborative learning	S	KH
5	Enhancement skills - Communication and language skills		
FC 5.1	Demonstrate ability to communicate with patient and families, be aware of barriers to communication and appropriate ways to respond	C	SH
FC 5.2	Demonstrate use of local language in patient and peer interactions	C	SH
FC 5.3	Demonstrate ability to communicate and learn in English	C	SH
FC 5.4	Demonstrate basic computer skills	S	SH
FC 5.5	Demonstrate ability for accessing online resources	S	SH

7. Formative and Internal Assessment

- Foundation Course is compulsory and an attendance of 75% will be mandatory
- Feedback, comments and/or grades about the student's performance by the faculty mentor can be documented particularly for the skills training
- The performance of the students in the Foundation Course will **NOT** contribute towards internal assessment marks.
- Student's feedback about the Foundation Course also needs to be documented in a structured format. This will help in gathering student's perceptions about various aspects of Foundation Course and help in program evaluation and refinement.

8. Capacity Building for Faculty

The components of the Foundation Course are multifarious and will require resource faculty from various disciplines. Many of these identified areas of the Foundation Course will need to be followed up by more focused outcome-based sessions at various stages in the course of MBBS through activities spirally integrated throughout the course. The objectives of each of the sessions in the Foundation Course are specific and the resource faculty need to understand not only the content, context and specific objectives of these sessions but also the approach and need for an interactive teaching learning methodology. The Dean/Principal of every medical college will ensure that adequate faculty training and resources are made available for implementation of the Foundation Course.

9. Curricular Governance and Evaluation

The Dean/ Principal in each medical college will identify **a faculty coordinator from preclinical departments** for conduct of the Foundation Course.

The faculty coordinator will identify resource faculty for the various sessions from within and outside the institution and coordinate the training of the resource faculty, the implementation of the program and the evaluation of the program.

Program evaluation report from faculty and students will be submitted to curriculum committee within four weeks of completion of Foundation Course.

Annexures

(The following are examples of schedules and lesson plans that may be used for Foundation Course. Institutions are encouraged to make their own plan tailored to their local needs and aligned to proposed outcomes)

		Mon	Tue	Wed	Thu	Fri	Sat	Sun
Week 1	Morning	1A	1B	1C	1D	1E	2F	
	After noon	1A	1B 6A	1C 6A	1D 6A	1E 6A		
Week 2	Morning	2B	2A	2C	2D	2E	6B	
	After noon	2B	2A 6A	2C 6A	2D 6A	2E 6A		
Week 3	Morning	3A	4A	4C	4D	4G	4F 6B	
	After noon	3B	4A 6A	4C 6A	4D 6A	4E 6A		
Week 4	Morning	4H	4J	5A	5D	5D	5B 6B	
	After noon	4I	5B 6A	5B 6A	5B 6A	5B 6A		
Week 5	Morning	5D	5C	5C				
	After noon	5B	5C	4B				

Sample lesson plans

1. Orientation

The purpose of the Orientation Module is to provide the new MBBS student a greater understanding of the medical profession in a historical, local and national context, a knowledge of the institution in which he/she will spend the next six years, and an idea of his/her role as an MBBS student.

1A Orientation Module: Introduction to institution / campus / facilities

The medical students at the very beginning of their course should have a clear understanding of the goals of their training, the expectations of the nation, the vision and mission of the institution, Rules and Regulations of the organisation. They must also be provided an orientation to the campus and the facilities available.

FC 1.2	Demonstrate understanding of the Roles of an Indian Medical Graduate and relate it to the societal impact	A	KH
FC 1.3	Discuss and appreciate the expectations of the students from the nation, society, Institution, peers, colleagues and patients and vice versa	A	KH
FC 1.4	Demonstrate understanding of the rules and regulations of the institution	A	SH
FC 1.5	Orient themselves to the college campus, facilities, faculty, administrative structure, support systems and processes of the institution	A	KH

Objectives:

At the end of the session the students should be able to:

- Explain the Roles of the Indian Medical Graduate
- Discuss their expectations from the Nation, institution, society, colleagues and peers and vice versa
- Understand the Rules and Regulations of the Institution

- Familiarise themselves with the college campus, facilities, administrative structure, support systems and processes of the institution

Methodology

No.	Content area	Methodology	Time
1	Welcome and Introduction by institutional heads	Inspiring talk... to the new MBBS graduates and their parents	2 hours
2	Vision / Mission of the institution		
3	Roles of an Indian Medical Graduate		
4	Expectation of the students from Nation, Society, Institutions, colleagues and peers	Overview lecture/ interactive discussion	1 hour
4	Rules and Regulations of the institution	Overview lecture/ interactive discussion	1 hour
5	Orientation to the college / campus / facilities	<ul style="list-style-type: none"> ▪ Walk through the college including lecture halls, common rooms, preclinical departments, office of the Dean and administration, library, food facilities, security facilities, auditorium – ▪ mini talks at important facilities regarding Rules and Regulations 	4 hours
6	Introduction to faculty / mentors	Interactive session with faculty mentors and peers	2 hours

Assessment: Open feedback at the end of the Foundation Course

1B. Orientation Module: Role of doctors in the society

It is important for new entrants to the new MBBS program to have a clear understanding of the roles and responsibilities of a doctor in society and the expectations from society, patients and the profession. It is important to sensitise and inspire students to the wider roles of physicians in society beyond patient-doctor interaction.

FC 1.1	Demonstrate understanding of the role of the doctors in the society and their impact	A	KH
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Objectives:

At the end of this session, the student will be able to:

1. Appreciate the wider role of physicians in society beyond the physician – patient interaction
2. Reflection their own potential roles in society

At the end of this session, the moderators will be able to:

1. Better understand the attitude of students who join the medical course regarding their perceptions of the social role of physicians
2. Review the session and make plans for:
 - a. Further sessions
 - b. The session next year

Methodology

No	Sub session	Methods	Requirements	Time
1	Introduction	Moderators, observers and other participants		10 minutes
2	Role of doctors buzz groups	<ul style="list-style-type: none"> • Create buzz groups of 10 students each • Ask each group to list, discuss and note down on separate cards the various roles of doctors • After 10 minutes, ask one student from each batch to bring up their cards to put on four different posters which will be labelled at the back as – diagnostic role, treating role, physician-patient interactive roles, societal role. ▪ The students will be blinded to labels at the back of poster. The moderator will help them separate and place their cards. • At the end, the entire group will view the posters – the moderator will turn the posters around to show the poster titles at the back <p>The discussion that follows will be based on the</p>	<p>10 cards per group i.e. 150 cards</p> <p>Felt pens</p> <p>04 large black poster sheets</p> <p>A4 white paper – for notes and observations</p>	30 minutes

		<p>nature of responses:</p> <ul style="list-style-type: none"> • Do the students see the doctor within a constrained role? • Is there a societal role for doctors in all conditions? – is there an even greater relevance in a diverse, unequal society like India • Is there a possibility that doctors remove themselves from society – us (ivory tower) AND them – the concept of isolationism and the ‘urban citadel’ 		
3	Short film	<p>Short film: In Silence – maternal mortality in India</p> <p>Discussion:</p> <ul style="list-style-type: none"> • Is this a medical problem or are there wider problems? • If there are wider problems, what are they? • What can doctors do to address wider problems? • Do doctors have privileged roles in society 	LCD projector with adequate sound facilities	30 minutes

		that they can exploit for greater common good?		
4	Meet the doctor	<p>Meet the doctor:</p> <p>Three doctors with diverse backgrounds who have chosen wider roles in society:</p> <p>They introduce themselves and their work</p> <p>Interview them:</p> <ul style="list-style-type: none"> • Why did they choose this option? • What were the choices that they had to make? • What challenges did they face? • What advice, if any, would they give to these students? 	Arrange chairs for visitors to face the students	60 minutes
5	Wrap up	<p>Wrap up:</p> <p>Each student gets one card.</p> <ul style="list-style-type: none"> • Think of one social issue in your own local area. • What could you do to help address that issue? 	<p>150 cards</p> <p>4 black poster sheets</p> <p>60 brief feedback questionnaires</p>	30 minutes

		<p>Students stick it on a poster entitled –</p> <ul style="list-style-type: none">• I AM PART OF SOCIETY – I CAN CONTRIBUTE TO IT• Time for entire batch to review what has been put up-• Which of the sessions did you like the most & why?		
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Alternative method

No	Sub Session	Methods	Requirements	Time
1	Introduction	<p>An interactive lecture to discuss</p> <ul style="list-style-type: none">• the roles of a physician and the expectation from the patient, families and society. <p>followed by small group discussion</p> <p>Videos / clippings relating to the roles of the doctor could also be used as a trigger for discussion</p>	<p>LCD projector, audio output for video, Appropriate Video clips, Flip charts, Marker pens</p>	1 hour
2	Shadowing the physician	<p>Students asked to shadow Physicians and</p> <ul style="list-style-type: none">• observe patient- physician interaction and their expectations from doctors		2 hours
3	Reflection	<p>Small group discussion and reflection</p>		2 hours
4	Wrap up	<p>Summarize salient points</p>		10 minutes

Assessment: Formative: May be assessed by active discussion in the small group session or by Reflective writing in log book.

1C.Orientation Module: History of Medicine and alternate systems

Students at the time of entry into MBBS must be introduced to the evolution of the system of medicine which they will be learning and appreciate the great men and women behind many of the seemingly mundane practices and concepts in modern medicine. The students should also be introduced to the alternative systems that are available and how they can impact patient preferences and choices.

FC 1.10	Demonstrate awareness of the History of Medicine and alternate systems of Medicine	K	K
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Objectives

At the end of the session, the students should be able to:

1. Discuss the History of Medicine
2. Distinguish Alternative Medicine, Complementary Medicine and Evidence based Medicine
3. Discuss the various Alternative Medicine practices in India and its practice impact

Methodology

No	Sub Session	Methods	Requirements	Time
1	Overview	lecture/ interactive discussion	LCD projector, Flip charts, Marker pens	30 minutes
2	Group work	Students, split into groups, are given a structured task on <ul style="list-style-type: none">• obtaining information on one important aspect of the History of Medicine (example – evolution of the germ	History of Medicine hand outs	3 hours

		<p>theory of medicine, discovery of vaccines,...etc)</p> <p>Small group discussion and reflection</p> <p>Presentation by groups and discussion</p>		
3	Alternate systems of Medicine	<p>lecture/ interactive discussion to address the following questions</p> <ul style="list-style-type: none"> • What is Alternative Medicine? • What is Complementary Medicine? • What is Evidence Based Medicine? • What is the difference between Modern Medicine and Complementary and Alternative Medicine (CAM)? • What is the practice impact? 	LCD projector, Flip charts, Marker pens	1 hour
3	Wrap up	Summation and learning points		10 minutes

Assessment: General feedback about the usefulness of the session for future planning

1D. Orientation Module: IMG roles / overview of MBBS curriculum and various career pathways

It is important for medical students at entry to have an overview of the curricular frame work and the expected learning outcomes from them. It is very important for them to know their career path and the road ahead.

FC 1.2	Demonstrate understanding of the Roles of an Indian Medical Graduate and relate it to the societal impact	A	KH
FC 1.7	Demonstrate understanding of the overview of MBBS curriculum, its structure and outcomes and its relation to the career pathways	K	KH
FC 1.6	Discuss the various career pathways and opportunities for personal growth	A	KH

The objectives

At the end of the session, the students should be able to:

- Comprehend the overall Goal and outcomes of the MBBS program
- Reflect on the various Roles of the Indian Medical Graduate
- Discuss the structure of the MBBS program
- Recognise the various career pathways that are available for their Career growth

Methodology

No	Sub Session	Methods	Requirements	Time
1	GMR 2019	Lecture/ interactive discussion about the salient features of the GMR 2019 <ul style="list-style-type: none">• Explain the MBBS curriculum, its structure, outcomes and curricular requirements for course completion and program certification	LCD projector, Flip charts, Marker pens GMR 2019 handouts	1 hour
2	Panel discussion	A panel of specialists and physicians from diverse career pathways <ul style="list-style-type: none">• Discuss the opportunities for the students followed by a question answer session. This could be done by the Alumni from various career back grounds		2 hour
3	Wrap up	Summation and learning points		10 minutes

Assessment: General feedback about the usefulness of the session for future planning

1E Orientation Module: Principles of family practice

The students need to be provided a basic understanding of the concept of family practice and holistic care. It is also important for the student to understand the role of the family practitioner in the health system, the role they could play at the various levels of health care.

FC1.8	Demonstrate understanding the role of physician at various levels of Health care delivery	K	KH
FC 1.9	Discuss the principles of family practice	K	KH

Objectives:

At the end of this session, the student will be able to:

1. Discuss the principles of family practice and holistic care
2. Describe the role of the physician in the health care system

Methodology

No	Sub Session	Methods	Requirements	Time
1	Principles of family practice and holistic care	Lecture/ interactive discussion about the ten principles of family practice: <ul style="list-style-type: none">▪ Caring▪ Clinical Competence▪ Cost-effectiveness▪ Continuity of care▪ Comprehensive care▪ Common problems management expertise	LCD projector, Flip charts, Marker pens Case vignette or a visit to a family practitioner	1 hour

		<ul style="list-style-type: none"> ▪ Co-ordination of Care ▪ Community based care and research ▪ Counselling and Communication skills ▪ Continuing Medical Education (CME) <p>Depending on available time the session may be preceded by either an appropriate case vignette or a visit to a family practitioner</p>		
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Assessment: Formative: Reflective writing

2. Skills

The fresh undergraduate student should be aware of some basic principles of Hospital safety and trained in certain basic skills that are mandated before they enter patient care areas. These are a part of quality initiatives to ensure patient and physician safety.

2A and 2B Skills module 1 and 2: BLS and First Aid

New entrants into medical fraternity should have a basic understanding of resuscitation and first aid skills.

The Basic Life Support (BLS): CPR provider training is designed to provide the students with foundational knowledge and skills needed to perform cardiopulmonary resuscitation (CPR) and other lifesaving skills. The first-aid component of this course addresses additional circumstances and diseases that may require intervention and assistance before the patient is transferred to emergency medical services.

FC 2.1	Perform Basic Life support in Skills lab	S	SH
FC 2.2	Perform First Aid in a simulated environment	S	SH

Objectives:

At the end of this session, the student will be able to:

1. Perform adequate chest compressions, deliver adequate ventilations in adults and children and appropriately use of an Automated External Defibrillator (AED).
2. Recognize and initiate first aid for several life threatening emergencies.

150 students can be divided into two groups of 75 each. Each group should be engaged by facilitators for a three hour session inclusive of break and subsequently groups should be rotated.

Group 1: Basic Life Support

No	Sub Session	Methods	Requirements	Time
1	Introduction	Introduction to Basic Life Support. Its importance and need.		15 minutes
2	Demonstration with appropriate videos followed by Hands on training	<p>15 groups of 5 students each = 75 Total</p> <p>Demonstrate individual skills of basic life support followed by hands on practice of each skill and finally integration of all the skills in a patient scenario.</p> <ul style="list-style-type: none"> • Introduce them to C-A-B algorithm • Recognition of cardiac and respiratory arrest • Pulse check • Chest compression • Delivering effective breaths • Use of an AED • Integration of all skill sets into a single scenario. <p>These skills will be taught for both adults and children (including infants)</p>	<p>Space/Area to accommodate 75 students,</p> <p>Adult, child and infant Basic Life support mannequins.</p> <p>LCD projector with adequate sound facilities to show appropriate videos.</p>	2.5 hours (150 minutes)
3	Wrap up	Feedback from students and guidance for future learning		15 minutes

Group 2: First Aid

No	Sub Session	Methods	Requirements	Time
1	Introduction	Introduction to several life threatening emergencies, the importance of first aid and its benefits.		15 minutes
2	Appropriate videos followed by discussion and hands on training when required.	<p>75 students: Table top discussion</p> <p>Initial videos to demonstrate emergency scenarios followed by appropriate first aid.</p> <ul style="list-style-type: none"> • First Aid Basics (Approach) • Medical emergencies (Breathing problems, Choking, Allergic reactions) • Injury Emergencies (Bleeding, Bandaging, Burns, Electrical Injuries) • Environmental Emergencies (Bites and stings, heat cramps) <p>Emphasis on Do's and Don'ts in each category.</p>	<p>Space/Area to accommodate 75 students,</p> <p>adult, child and infant Basic Life support mannequins.</p> <p>LCD projector with adequate sound facilities to show appropriate videos.</p>	2.5 hours (150 minutes)
3	Wrap up	Feedback from students and guidance for future learning		15 minutes

Assessment: Assessment of skill performance as a part of the formative assessment

2C Skills Module: Universal Precautions (UP)

FC 2.3	Follow biosafety and universal precautions	S	SH
FC 2.4	Demonstrate handling and safe disposal of Bio hazardous materials in a simulated environment	S	SH
FC 2.5	Demonstrate proper hand washing and use of personal protective equipment	S	SH
FC 2.6	Demonstrate appropriate response to needle stick injuries	S	SH

Objectives:

At the end of this session, the student will be able to:

1. Define Universal Precautions
2. List essential components of Universal Precautions
3. List infective and non- infective body fluids
4. Demonstrate correct techniques of Hand washing, gloving/degloving, disinfection, handling sharps, waste disposal

Methodology

No	Sub Session	Methods	Requirements	Time
1	Definition of Universal Precautions (UP)	<p>Interactive lecture about:</p> <ul style="list-style-type: none">▪ Definition of UP▪ Essential components of UP▪ Infective and non-infective body fluids (may use a drill to recap)	LCD projector, Flip charts, Marker pens	1 hour
2	Interactive practical demonstration	<ul style="list-style-type: none">▪ Divide the students into groups of not more than 10 per group. <p>There should be one faculty per group who will conduct an interactive practical demo about</p> <ul style="list-style-type: none">▪ Use of hand rub▪ Gloving and de-gloving <p>The students will be then allowed to demonstrate the correct method and receive feedback</p>		2 hour
3	Wrap up	Summation and learning points		10 minutes

Assessment: Formative assessment, OSCE

2D Skills Module: Waste management

FC 2.7	Demonstrate Biomedical Waste (BMW) segregation, observe and reflect on the process of management of BMW in accordance with National regulation	S	SH
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Objectives:

At the end of this session, the student will be able to:

1. Define biomedical waste
2. Explain the hazards of improper disposal of biomedical wastes
3. Describe the different types of waste generated in a health care facility
4. Explain how one should segregate waste
5. Explain how one should dispose biomedical wastes
6. Methodology

No	Sub session	Methods	Requirements	Time
1	Definition of BMW	Interactive lecture about: <ul style="list-style-type: none">▪ Definition of biomedical wastes▪ Different types of waste generated in a health care facility)▪ Segregation and disposal of waste	LCD projector, Flip charts, Marker pens	1 hour

Assessment: Students may present a reflection of their observation, OSCE on BMW segregation

2E Skills Module: Immunization

The students should be sensitised to the occupational exposure and the need for protection and safety. During this session, it's important to review the immunisation status of the students and also ensure compliance to the requirements.

FC 2.8	Discuss the Immunization requirements of Health care professionals	K	KH
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Objectives:

At the end of this session, the student will be able to:

1. List the vaccine-preventable diseases (VPD)
2. Explain why vaccination is important for staff and students
3. Describe the vaccination recommendation for health care personnel (Hepatitis B, Chicken pox etc.)

Methodology

No	Sub Session	Methods	Requirements	Time
1	Vaccine-preventable diseases and recommendations for health care personnel	Interactive lecture about: <ul style="list-style-type: none">• What are vaccine-preventable diseases (VPD)?• Why is vaccination important for staff?• VPDs in healthcare• Recommendation for health care personnel (Hepatitis B, Chicken pox)	LCD projector, Flip charts, Marker pens	1 hour

Assessment: Formative assessment, short notes, Viva in summative assessments

2F Skills Module: Documentation

The students in the first year should be introduced to the importance of “Documentation” in patient care. They should learn the method of appropriate documentation and understand its significance in patient and employee safety.

FC 2.9	Demonstrate awareness of significance of documentation in patient care and the proper method of documentation	S	SH
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Objectives

At the end of the session, the students should be able to:

- Explain the importance of documentation as a physician responsibility
- Discuss the consequences of appropriate and inappropriate documentation on patient and employee safety
- Observe the correct method of documentation in patient record
- Reflect on the process

Method: Large group session that gives an overview and demonstrates the documentation process and explains the right and wrong ways.

- The students can be asked to do mock audit and discuss on patient records (dummy records) with a check list .Small group sessions with peer interaction to guide the new students on the process

Assessment: Formative assessment

3. Community Orientation Module

3A. Community Orientation Module: National Health goals and policies/ health care systems / community health

The medical student should be exposed from the beginning to the community in order to get a bird's eye view of the social, demographic, environmental and cultural factors that influence health and the system of health care delivery at the primary level of health care.

FC 3.1	Demonstrate understanding of the National Health Goals and Policies	K	KH
FC 3.2	Discuss the national health scenario, demographic, socio cultural and epidemiological issues	K	KH
FC 3.3	Demonstrate understanding of the health care systems in India with reference to primary, secondary and tertiary level care	K	KH
FC 3.4	Discuss the basic principles of community health and its impact on health and disease	S	SH
FC 3.5	Demonstrate understanding of the structure and functioning of the community health center	K	KH

Objectives:

At the end of this session, the student will be able to:

1. Explain the National Health goals and policies
2. Discuss the National health scenario, demographic, socio-cultural and epidemiological issues
3. Discuss the health care systems in India with reference to primary, secondary and tertiary level care
4. Describe the basic principles of community health and its impact on Health and disease
5. Observe the structure and functioning of the community health centre
6. Reflect on the observation

Methodology

No	Sub Session	Methods	Requirements	Time
1	National Health: goals and policies	Interactive lecture on National health goals and policies	LCD projector, Flip charts, Marker pens	1 hour
2	National health scenario	Interactive lecture on National health goals and policies	LCD projector, Flip charts, Marker pens	1 hour
3	Health care systems in India	Community Health Centre visit and reflection on the experience with particular reference to:	Logistics for community visit	4 hours
4	Principles of community health	A) Levels of health care in a community setting B) Interaction with families in the community setting and the impact of health		
5	Community Health Center	C) Functioning of the Community Health Centre and health care team Community visit followed by a discussion back in the college		

Assessment: Formative: Reflection writing / discussion of the experience

3B. Community Orientation Module: Interactions with patients and families and communities.

Exposure to the community in the beginning of their profession will sensitize the students to the actual community living of people, the disease impact in the community and its impact on the patient's families and health workers.

FC 3.6	Demonstrate ability to obtain patient experiences through patient and family interactions and relate these experiences to impact of environment and diseases.	S	SH
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Objectives:

At the end of this session, the student will be able to demonstrate an understanding of:

1. The effect of family and social environment in the aetiology of diseases
2. Community beliefs and practices related to health and illnesses
3. The environmental health problems in the community
4. Patient experiences to diseases treatment-seeking practice

Methodology

No	Sub Session	Methods	Requirements	Time
1	Interaction with patients and families and communities.	<ul style="list-style-type: none">• Community Health centre visit and reflection on the experience with particular reference to:• The effect of family and social environment in the aetiology of diseases• Community beliefs and practices related to	Logistics for community visit LCD projector, Flip charts, Marker pens	1 hour (The time for community visit is factored in in the previous session)

		<p>health and illnesses</p> <ul style="list-style-type: none">• The environmental health problems in the community• Patient experiences to diseases treatment-seeking practice• Community visit followed by a discussion back in the college		
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Assessment: Formative: Reflective writing of their observations

4. Professional Development and Ethics

4A. Professional Development and Ethics Module: Concept of Professionalism and Ethics

The students should be introduced to the concept of professionalism and ethics as an important domain in their learning and practice. They should be made aware of the code of conduct and its significance in life and career.

FC 4.1	Demonstrate understanding of the concept of Professionalism and ethics among health care professionals and discuss the consequences of unprofessional and unethical behavior	S	KH
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Objectives:

At the end of this session, the student will be able to:

1. Explain the concept of professionalism and ethics among health care professionals
2. Describe the consequences of unprofessional and unethical behavior

Methodology

No	Sub Session	Methods	Requirements	Time
1	Professionalism and Ethics – the concept	<ul style="list-style-type: none">• Interactive lecture about using case vignettes and video• Could use a drill with various scenarios depicting professional and unprofessional behaviour	LCD projector, Flip charts, Marker pens	1 hour
2	Consequences of unprofessional and unethical behavior	<ul style="list-style-type: none">• Group work using case vignettes / video• Group presentation and discussion with reference to consequences of unprofessional and unethical behavior		1 hour

Assessment: Formative assessment

4B. Professionalism and Ethics Module: White coat ceremony

FC 4.2	Demonstrate understanding that compassion, altruism, integrity, duty, responsibility and trust are the core values that defines the nature of the physician's work	K	KH
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Objective:

At the end of the session, the student is able to:

1. Appreciate the significance of White Coat Ceremony

The white coat reminds physicians of their professional duties, as prescribed by Hippocrates, to lead their lives and practice their art in uprightness and honour. The white coat is a symbol of our profession.

The White Coat Ceremony is a rite of passage, welcoming the new medical students into the medical profession. As medical students, they are bound by the same professional commitments that bind all physicians. This ceremony will join the symbol of the white coat with the virtues of altruism, responsibility, duty, honour, respect, and compassion.

Assessment: Reflections

4C Professionalism and Ethics Module 3: Professional and altruistic behaviour

FC 4.2	Demonstrate understanding that compassion, altruism, integrity duty, responsibility and trust are the core values that defines the nature of the Physician work	K	KH
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Objective

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

- Describe Altruism
- Discuss Altruism as an important professional virtue of a physician

1	Altruism as a virtue of a Physician	<ul style="list-style-type: none">• Guest lecture / Address by the dean or director• Case based interactive lecture	LCD projector, Flip charts, Marker pens	1 hour
2	Case discussion	<ul style="list-style-type: none">• The students will discuss case in groups		1 hour

Assessment: Formative assessment while discussing in groups

4D Professionalism and Ethics Module: Working in a health care team

One of the major roles of the Indian Medical Graduate is that of being a member of a health care team. While the MBBS program is structured to build this competence during its course, an introduction to the concept of working in a team is essential at the beginning.

FC 4.3	Discuss the value of honesty and respect during interaction with peers, seniors, faculty, other health care workers and patients	S	KH
FC 4.4	Discuss the significance of working in a health care team	S	KH

Objectives:

At the end of this session, the student will be able to:

1. Describe the significance of working in a health care team
2. Discuss the role of honesty, respect and trust

Methodology

No	Sub Session	Methods	Requirements	Time
1	Working in a health care team	<ol style="list-style-type: none">1. The students visit several patient care area and observe functioning of the Multidisciplinary teams, such as the emergency OPD, or OT, or labour room2. The students may be posted in small groups to observe and reflect with regard to the 5	LCD projector, Flip charts, Marker pens	1 hour

		<p>important aspects of working in a team:</p> <ul style="list-style-type: none">a. Shared goalsb. Communicationc. Leadershipd. Role claritye. Trust / respect <p>3. Group presentation and discussion</p>		
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3. **Assessment** : Formative assessment during group discussions / presentations

4E Professionalism and ethics Module 5: Disability competencies

As newly joined medical students, they need to recognize the importance of various deviations from majority that are happening in human life. Disability is part of human diversity. Differently abled individuals need to be understood and recognized by any stream that deals with human life.

India was one of the first major country who ratified the greatest human rights instrument of 21st Century, the United Nations Convention on the Rights of Persons with Disabilities (CRPD) and accordingly amended its disability legislation incorporating human rights approach to Rights of Persons with Disabilities (RPDA) Act, 2016. The Act mandates inducting disability content into all professional courses including medical field.

Educational Strategy

An Indian Medical Graduate is expected to have disability competence which is the skills and attributes essential to provide quality health care to patients with disabilities. It is the social responsibility of medical institutions to be empathetic towards the marginalized section. Disability competencies and suggested teaching-learning methods are provided in table 2.

Table 2. Disability Competencies under the Five Roles of the Indian Medical Graduate (IMG)

IMG Role	FC 4.5	Domain	Level	Suggested TLM	Duration
	Competencies addressed				
	The student should be able to:				

Clinician	4.5.1 Describe disability as per United Nations Convention on the Rights of Persons with Disabilities while demonstrating respect for the differences and capacities of persons with disabilities as part of human diversity and humanity.	K	KH	Lecture/or panel discussion involving person with disability	1 hour
Clinician	4.5.2 Compare and contrast medical and social model of disability.	K	KH	Patient narratives in small groups followed by sharing amongst groups	
Communicator	4.5.3 Build an understanding on the disability etiquettes while addressing people with disabilities	S/A	SH	Standardized patient with disabilities in small groups followed by sharing amongst groups	1 hour
Lifelong learner	4.5.4 Demonstrate awareness of the disabilities included in the Rights of Persons with Disabilities Act, 2016.	K	KH	Case histories, incidental reports in small groups followed by sharing amongst groups	
Communicator	4.5.5 Demonstrate the use of verbal and non-verbal empathetic communication techniques while communicating with people with disabilities	S/A	SH	Clinical patient encounter with guidance in small groups followed by sharing amongst groups	1 hour

Professional	4.5.6 Demonstrate a non-discriminatory behaviour towards patients or caregivers with disabilities	A	SH	Video or simulated encounters or Forum Theatre (Theatre of the Oppressed) Class room Session	
Lifelong learner	4.5.7 Have an understanding of accessible healthcare setting for patients with disabilities, including universal design	K	KH	Functioning of NGO or accessible Disability Unit	Visit or SGD-2 hours
Leader	4.5.8 Advocate social inclusion by raising awareness of the human rights of persons with disabilities.	K	KH	Self-reflection paper/blog SDL	SDL- 2 hours

Modified-from Disability-inclusive Compassionate Care: Core Competencies on Disability for Health Professions Education by Medical Humanities Group, UCMS, Delhi

4F. Professionalism and Ethics Module: Cultural competence

Cultural competence is the ability to interact respectfully with colleagues from any culture and requires critical consciousness. It is a congruent set of behaviours, attitudes, skills, policy and procedures that come together in a system, agency, or among individual professionals to enable them to work effectively in cross cultural situations. This is relevant for the medical students as they are joining MBBS in medical colleges throughout all states in India and students from outside India are also joining medical colleges in India. Therefore, the cross cultural component will help students a lot as the cultural diversity is unique and vast in the country.

FC 4.6	Demonstrate understanding and respect of cultural diversities and interact with those with different cultural values	K/A	KH
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Objectives:

At the end of this session, the student will be able to:

1. Describe components of cultural competence

Methodology

No	Sub Session	Methods	Requirements	Time
1	Components of cultural competence	<ul style="list-style-type: none">• An interactive lecture on the components	LCD projector, Flip charts, Marker pens	1 hour

Professionalism and Ethics Module: Stress management

The first year students are challenged with many changes including the new place, peers, atmosphere, environment and a major leap in the learning styles and contents. This induces stress making them vulnerable. Hence, it is important to address the role of stress during their learning period and methods to enhance their resilience.

FC 4.7	Discuss the significance and methods of stress management and risk taking behaviour.	K	KH
FC 4.8	Understand the role of yoga and meditation in personal health	S	S

Objectives

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

- Describe the situation that may cause stress during their learning period
- Discuss the health impact of stress
- Appreciate the various stress management techniques including yoga and meditation
- Discuss the spectrum of risk - taking behaviour, consequences and ways to manage

Case based discussion to be held in small groups on stressful situations such, academic stress, examination stress, peer pressure, family pressure, gender issues, discrimination, dealing with emotions. Various risk taking behaviours such as violence, drug abuse, rash driving, bullying etc. should be addressed.

A Yoga / Meditation demonstration by an expert followed by reflection on the experience may be done.

4 H Professional Development and Ethics Module: Time management

Good time management is essential for a Professional. Many deadlines for college work occur at the same time, and unless the student plans ahead, he/she will find it difficult to manage. Learning how to manage time will help them maintain academic performance as well as a life outside of school.

FC 4.9	Discuss the significance and appropriate ways of time management	S	SH
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Objectives:

At the end of this session, the student will be able to:

1. Describe the importance of time management
2. Prioritize their activities in order to manage time better
3. Identify and handle their own distractions and interruptions

Methodology

No	Sub Session	Methods	Requirements	Time
1	Importance of time management	<ul style="list-style-type: none">• An interactive lecture	LCD projector, Flip charts, Marker pens	1/2 hour
2	Prioritization	<ul style="list-style-type: none">• Group work using the “action priority matrix”• Discussion		1 hour

3	Distractions and Interruptions	<ul style="list-style-type: none"> • Administer the time management skills questionnaire • Students to reflect their own strengths • Ask students to work in groups and write down what they think are the main distractions / interruptions that a MBBS student will face. • Ask the groups to discuss and present the solutions to the above 		1 hour
4	Wrap up	Summarize and take general feedback about the session		5 minutes

Assessment: Formative

4I Professional Development and Ethics Module: Interpersonal relationship

The students should understand the role of interpersonal relationship while interacting with the patients, families, peers, superiors and health care personnel. They should understand the significance of these interactions and professional boundaries. They should understand and experience the role of mentoring in personal and professional growth.

FC 4.10	Demonstrate understanding of importance of interpersonal relationship while working in a health care team	S	KH
FC 4.11	Understand the role of mentoring	S	KH

Learning method:

- (1) Role plays to understand the significance of interpersonal relationship and group discussion
- (2) Interactive lecture on Mentoring followed by allotment of mentors to the new batch
- (3) Mentor-Mentee interaction and road ahead

4J Professionalism and Ethics: Learning

After years of formal schooling, students enter the MBBS course often without having mastered the fundamental skills of learning. When they begin their course and are propelled into a more active learner mode, understanding of these fundamentals becomes vital. Students will learn how to learn through many avenues, such as modelling, curiosity, and situational need. This session on learning is included in the Foundation Course as a way to help them understand the process learning.

FC 4.12	Demonstrate understanding of the process of group learning and group dynamics	S	KH
FC 4.13	Comprehend the learning pedagogy and its role in learning skills	S	KH

FC 4.14	Demonstrate understanding of different methods of self-directed learning	S	KH
FC 4.15	Understand collaborative learning	S	KH

Objectives:

1. To recognize the need to learn
2. To identify and maximize one's learning style
3. To describe how people learn
4. Experience collaborative and group learning
5. Discuss the methods of SDL and its application in their routine learning

Learning method

- Students are subjected learning style evaluation and asked to reflect
- Students are exposed to various methods through self -experience and role play and asked to reflect

Assessment: Nil

5 Enhancement of Language and Computer Skills:

5A Enhancement of Language and Computer Skills Module: Communication

Good communication skills are essential for an optimal doctor-patient relationship, relationship between peers/colleagues and also colleagues in a team which ultimately also contributes to improved health outcomes. Training in communication skills needs approaches which are different from that of teaching other clinical subjects.

FC5.1	Demonstrate ability to communicate with patient and families, be aware of barriers to communication and appropriate ways to respond	C	SH
-------	---	---	----

Objectives:

At the end of this session, the student will be able to:

1. Describe the basic elements of communication skills
2. Explain the importance of listening and empathy in communication
3. Explain the importance of good communication skills in medicine
4. Recognise the common barriers to communication
5. Observe patient and family interactions (Videos , Role plays)
6. Reflect on the appropriate ways to respond

Methodology

No	Sub Session	Methods	Requirements	Time
1	Basic communication skills	<ul style="list-style-type: none">• Lectures (PPT), role plays, group	LCD projector, Flip charts,	3 hours

2	Listening skills	discussions, brainstorming	Marker pens	
3	Importance of empathy in communication skills			
4	Importance of good communication in medicine			
5	Observe patient and family interactions	<ul style="list-style-type: none"> • Video demo / Role play of patient and family interaction • Ask students to reflect on appropriate and inappropriate responses 	Video	

Assessment: Formative during group discussions

5B Enhancement Skills Module 8: Local Language skills

The local language skills training will be conducted as per the felt need and may continue beyond the Foundation Course.

FC 5.2	Demonstrate use of local language in patient and peer interactions	C	SH
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Sessions will be organised in small groups and rotated between enhancement skills

5C Enhancement Skills Module 8: English Language skills

The English language skills training will be conducted as per the felt need and may continue beyond the Foundation Course.

FC 5.3	Demonstrate ability to communicate and learn in English	C	SH
--------	---	---	----

Sessions will be organised in small groups and rotated between enhancement skills

Enhancement of Language and computer skills Module: Basic computer skills

The students should be competent in the use of ICT in teaching and learning. The students should be introduced to the basic use of word and power point, familiar with search engines, in performing a literature search and accessing online resources.

FC 5.4	Demonstrate basic computer skills	S	SH
FC 5.5	Demonstrate ability for accessing online resources	S	SH

The students are posted to the computer / Active learning centre for the training and it will continue as per need of the students beyond Foundation Course

6 Sports and extracurricular activities

Should be for a mandatory 4 hours per week and extra-curricular activities 2 hours per week, subject to a maximum of 22 hours

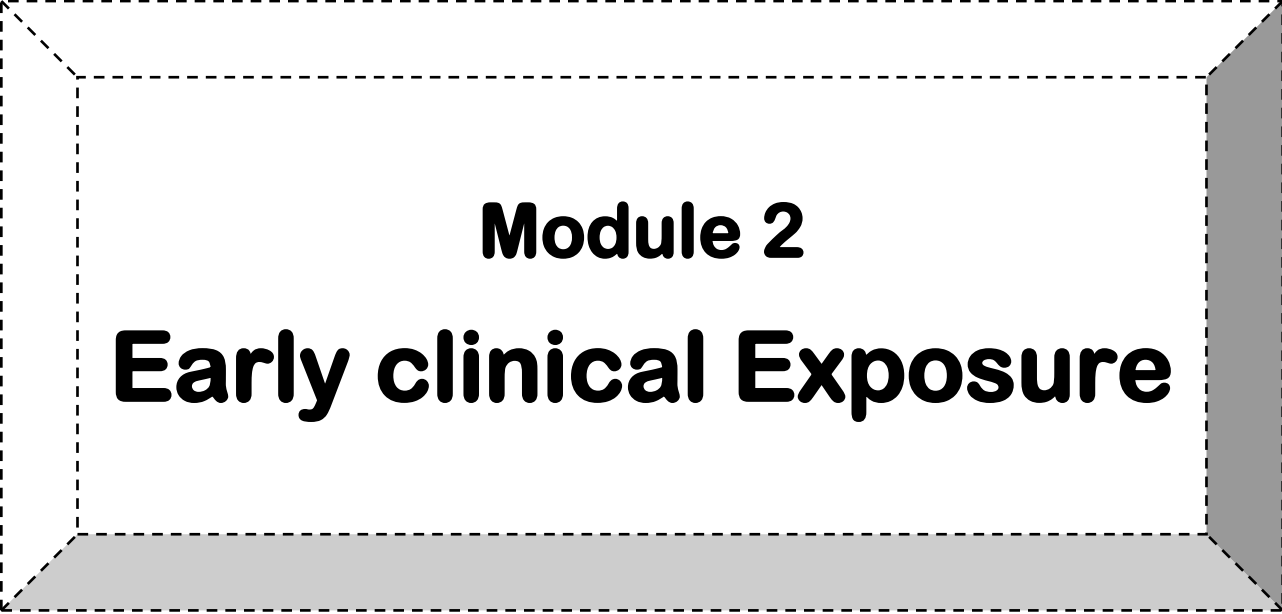
1. Further Reading link

<https://www.mciindia.org/CMS/wp-content/uploads/2019/01/UG-Curriculum-Vol-I.pdf>

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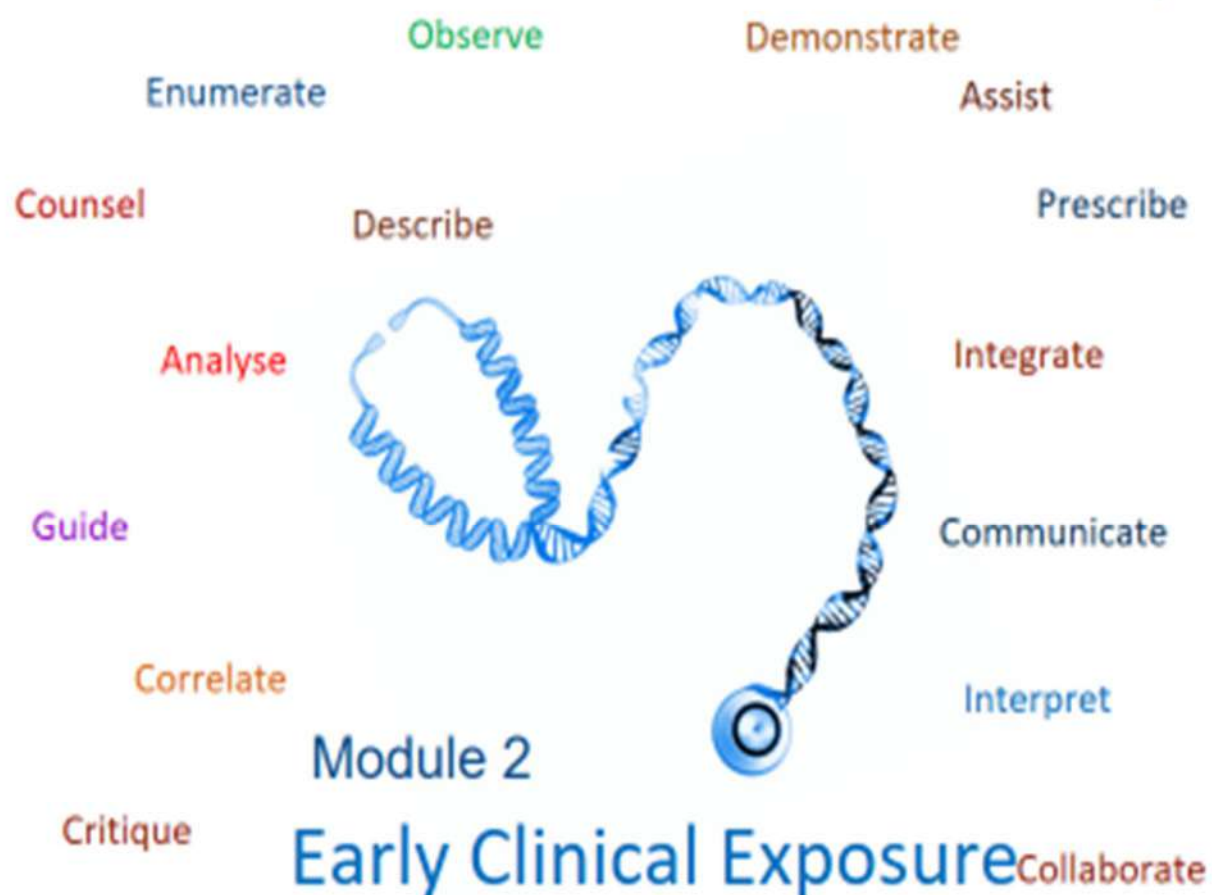
Module 2
Early clinical Exposure



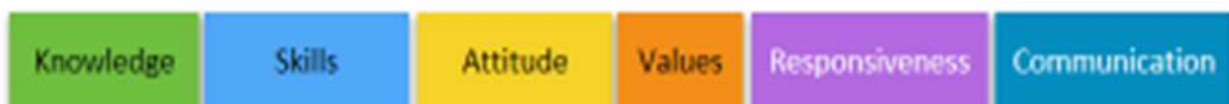
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COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE

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Curriculum Implementation Support Program

**Early Clinical Exposure for
Undergraduate Medical Education
Program
2019**



**Medical Council of India
Pocket-14, Sector-8, Dwarka,
New Delhi 110 077**

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Foreword

Early Clinical Exposure

The primary objective of medical education is to prepare students for a lifetime of patient care. The students must not lose this perspective through their years of study. One of the key requisites of a curriculum is providing relevance to learning. The competency driven curriculum developed for the MBBS program has several unique features that guides student learning by maintaining a focus on patients.

Early Clinical Exposure introduces some aspects of clinical and social contexts of patient care into the first year of undergraduate teaching program. The purpose of this program is to provide a reference to basic science learning so that students can understand the applicative aspects of learning. Importantly it helps to reinforce comprehension of normal and its altered expression and disease states.

Early patient contact by the student is desirable because it introduces the learner to the most important stakeholder in his or her career at a nascent time; this will hopefully provide the stimulus and encouragement required for the learner to focus on the task ahead. Simple designed programs - allowing patient interaction/context in a supervised setting - will facilitate the student to learn from patient's perception of illness, its effect on health, its impact on family relationships and well-being and professional activity. Providing such opportunities for "immersive learning" early in the curriculum will shape the learner's commitment to care, empathy, altruism and service, the guiding principles enshrined in the new curriculum.

Introduction of Early Clinical Exposure in the undergraduate curriculum fulfills a long standing request of educators. This booklet incorporates some ideas and best practices gleaned from experts and institutions across the country. We are confident that each institution will add to this corpus of experience, their own lessons, cases and modules and hopefully share them with other institutions.

The Early Clinical Exposure program is designed to enrich the learning experience of the student and provide him or her tools that will not only strengthen the foundation laid in the first phase, but also bring to focus the larger import of learning done in that phase to future phases and career. We are grateful to the members of the Expert Group and the Academic Cell for painstakingly putting this booklet together. We hope that teachers and institutions will benefit from the suggestions provided herein and can successfully adapt and apply them into their own environment.


Chairman, BOG

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MEDICAL COUNCIL OF INDIA
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Foreword

Early Clinical Exposure

This booklet provides a suggested pattern for the Early Clinical Exposure component for the MBBS program commencing 2019. The Early Clinical Exposure component allows students to understand basic science from an applicative perspective. The ability to learn concepts with their future application will generate interest and provide for greater retention and comprehension in the learner. One key aspect of this component is provision of authentic human contact. Exposure to patients and their families early will be a great influence on the professional and personal development of students and provide a stimulus to improved learning.

This booklet has been developed by experts invited by the Board of Governors in super session of the MCI and incorporates their vast expertise and experience. The time and effort spent in creating this guide that can be used by institutions to develop their own learning process and content is gratefully acknowledged. Appreciation is also due to the efforts of the Academic Cell and of the faculty at various Regional and Nodal centers who worked tirelessly to ensure that the new competency driven curriculum and its various unique components are implemented fully and flawlessly across the medical colleges in the country.

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Curriculum Implementation Support Program

Module – 2

EARLY CLINICAL EXPOSURE

Early Clinical Exposure

Guidelines for Universities, Curricular Committees and Faculty

Early Clinical Exposure (ECE) provides a clinical context and relevance to basic sciences learning. It also facilitates early involvement in the healthcare environment that serves as motivation and reference point for students, leading to their professional growth & development.

1. Objectives of the Document are to:

- Describe the modalities of applications of ECE in a medical college
- Facilitate the development of modules of ECE for students
- Facilitate Implementation of ECE in their medical college

2. Introduction:

Students require context to understand basic sciences. They also require grounding in human and social aspects of the practice of medicine. Early clinical correlation and exposure to clinical environment will provide a point of reference and relevance to the novice learner. The ECE program in the MBBS curriculum tries to create an opportunity for students to correlate learning in Phase I subjects with their clinical application. Learning of basic sciences with respect to a clinical context can improve student's motivation to learn and also improve retention. It also provides authentic human context and early introduction to immersion into the clinical environment.

The MBBS curriculum has therefore been modified such that clinical exposure can be introduced earlier along with the basic sciences. Students will be able to learn the basic and clinical sciences by means of integrating learning activities, like early clinical contact, clinical skills, communication skills or task-based learning sessions.

Students can be exposed to clinical experiences in various forms and in a variety of settings which are outlined in this booklet. This does not reduce the

importance of traditional basic science instruction, but enriches and contextualizes the learning for the students.

3. Objectives of Early Clinical Exposure:

The objectives of early clinical exposure of the first-year medical learners are to enable the learner to:

- (a) Recognize the relevance of basic sciences in diagnosis, patient care and treatment
- (b) Provide a context that will enhance basic science learning
- (c) Relate to experience of patients as a motivation to learn.
- (d) Recognize attitude, ethics and professionalism as integral to the doctor-patient relationship
- (e) Understand the socio-cultural context of diseases through the study of humanities

4. Elements of ECE:

The three elements of ECE are:

1. Provision of clinical correlation to basic sciences learning.
2. Provision of authentic human contact in a social or clinical context that enhances learning in the early/pre-clinical years of undergraduate education.
3. Introduction to humanities in medicine

Salient Principles:

The key principles underlying early clinical exposure are providing a clinical context and ensuring patient centrality. Early clinical exposure provides for the three key elements listed above. The clinical context can include case scenario, videos, actual patient, simulated patient etc. The presence of actual patients in every sessions of ECE, though not essential, is preferred. Therefore, ECE is exposure to the relevant clinical context in earlier years. It must be noted

that purpose of ECE is not to prepone the conventional clinical teaching but to provide better understanding of basic sciences through a clinical context.

5. Context from proposed GMER 2019:

9.2.1 Objectives:

The objectives of early clinical exposure of the first-year medical learners are to enable the learner to:

- (a) Recognize the relevance of basic sciences in diagnosis, patient care and treatment
- (b) Provide a context that will enhance basic science learning
- (c) Relate to experience of patients as a motivation to learn
- (d) Recognize attitude, ethics and professionalism as integral to the doctor-patient relationship
- (e) Understand the socio-cultural context of diseases through the study of humanities

9.2.2 Elements:

- a) **Basic science correlation:** To apply and correlate principles of basic sciences as they relate to the care of the patient (this will also become part of integrated modules).
- b) **Clinical skills:** To include basic skills in interviewing patients, doctor-patient communication, ethics and professionalism, critical thinking and analysis and self-learning (this training will be imparted in the time allotted for early clinical exposure).
- c) **Humanities:** To introduce learners to a broader understanding of the socio-economic framework and cultural context within which health is delivered through the study of humanities and social sciences.

6. Structure of the program for students:

Planning of activities & its distribution

It would be desirable to plan all teaching learning sessions in basic sciences around a clinical scenario so that students understand its relevance. But the clinical scenario in ECE should not be restricted to just the initial part of the teaching sessions, but form a framework around which learning will occur.

The time allotted for ECE in first year (as per GMR, 2019) is 90 hours which has to be equally divided among the three preclinical subjects. So the time available for each subject is 30 hours. It is suggested that, it can be further divided as follows:

- 1. Basic sciences correlation (18 hours):** One three hour session per month for 6 months may be allotted. The clinical context can be introduced using actual patient contact or by use of paper based cases, charts (e.g. use of spirogram, electromyogram with its clinical correlation), graphics (e.g. using photos of gigantism/hypothyroidism/ Cushing's syndrome in endocrinology), videos (e.g. videos depicting normal & abnormal respiratory movements, embryology, endoscopy, laryngoscopy etc.), reports (e.g. blood/urine reports indicating biochemical markers), field visits etc. in community/ hospital laboratories.
- 2. Clinical skills (experience and human context) (12 hours):** Three hour session per month for 4 months per department may be allotted. Cases may be demonstrated by preclinical faculty or clinicians, in out-patient departments/ wards/ demonstration rooms, as feasible, in small groups.

Each 3-hour session of clinical experience can follow the guidelines below:

- Introduction to the module & instruction by preclinical faculty: 30 minutes

- Clinical experience (in groups at different places like wards/OPDs/classrooms with guided observation/checklist): 1 hour 30 minutes
- Summary & conclusion (with learning points): 30 minutes
- Reflection (with guidance & monitoring) on what was learnt: 30 minutes

Examples of clinical context and related learning outcomes are provided in **Annexure I**.

Examples of deviations from normal to be observed and noted by student when exposed to clinical context are given in **Annexure II**. These can be used while preparing observation guides.

It is important to finalise a detailed observation guide for students and instruct them, before the actual interaction, regarding what he/she is supposed to observe during the ECE session. In observation guide, list out clinical features the student has to focus in the particular context. You may refer to the sample modules for ECE given in **Annexure III**.

- 3. Humanities:** This will be merged with AETCOM module and therefore no additional time is allotted.

A sample for Humanities module is attached in **Annexure IV**

7. Formative & Internal Assessment:

Formative assessment will have a major role in the teaching of Early Clinical Exposure. The assessment must focus on students' activities during ECE. Students will participate in various activities such as case based scenarios, live patient's interactions, simulated patients, videos etc. A record of these activities should be maintained and assessed periodically.

Elements from ECE should be included as appropriate in formative and summative assessments of the respective subjects.

A) Internal Assessment:

Early Clinical Exposure should be part of internal assessment for the respective subject. During assessment, questions should test clinical correlation in basic sciences.

B) University Examinations:

It is suggested that examinations should include elements from ECE to test the ability of the student to apply basic science knowledge in clinical context.

The Modified Essay Questions (Problem based long answer questions), Clinical vignette based Short Answers Questions (SAQ), objective type questions (e.g. Multiple Choice Questions - MCQs) and OSPE can include parts of ECE. **Annexure V** gives examples of clinical vignette based short answer questions.

8. Capacity Building for Faculty:

Faculty Development:

Faculty need to be reoriented to the principles and practice of early clinical exposure. Preclinical and clinical faculty need to coordinate and involve in the activities related to hospital visits. Clinical faculty may be involved in the planning of ECE sessions. Faculty should be trained to develop, implement and assess ECE which is relevant to their subjects and phases including setting question papers, use of case based questions, assessing clinical context in earlier years and applications of the ECE.

9. Implementation, Monitoring / Curricular Governance:

Planning, Implementation and oversight of ECE is the responsibility of the Curriculum Committee of the college. The Curriculum Committee (CC) will work

in collaboration with phase-wise curriculum subcommittee (CSC), and Heads of departments to plan the ECE sessions and coordinate hospital visits.

Responsibilities of Principal/Dean

- Hold regular meetings of the Curriculum Committee and Heads of Departments
- Ensure implementation of ECE & monitor its activities.

Responsibilities of Head of Departments

- Function as Coordinator of ECE program in their disciplines

Responsibilities of Curriculum Committee

- To review regularly and record ECE activities & make necessary changes /adjustments as required from time to time.
- To help in scheduling ECE sessions for class-room, hospital & community visit
- To ensure that the competency based UG curriculum is implemented by all departments as per MCI guidelines.

Responsibilities of MEU

- To arrange the sensitization programs for all faculty members (including the Principal/Dean, Heads of departments of pre-clinical & related clinical departments)
- To train and orient the resource persons

10. Further Reading:

List of resources

Must read

1. Başak O, Yaphe J, Spiegel W, Wilm S, Carelli F, Metsemakers JFM. Early clinical exposure in medical curricula across Europe: An overview. *Eur J Gen Pract.* 2009 Jan 1;15(1):4–10.

Additional reading

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9. Vyas R, Jacob M, Faith M, Isaac B, Rabi S, Sathishkumar S, et al. An effective integrated learning programme in the first year of the medical course. *Natl Med J India.* 2008; 21(1):21–6.
10. Sathishkumar S, Thomas N, Tharion E, Neelakantan N, Vyas R. Attitude of medical students towards Early Clinical Exposure in learning endocrine physiology. *BMC Med Educ.* 2007 Sep 5; 7:30.

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Annexure I

Examples of clinical context and related learning outcome

Clinical Context	Outcome
<p>Parkinson's disease (Neurophysiology) <i>Patient/video/simulated patient/role play</i></p>	<ol style="list-style-type: none"> 1. Demonstrate understanding of alterations in normal functions of Basal ganglia and their clinical expression. 2. Explain anatomical and physiological basis of signs & symptoms of Parkinson's disease 3. Observe examination of Motor system (Tone of the muscles) in a patient with Parkinson's disease
<p>COPD (Respiratory Physiology) <i>Patient/video/investigations</i></p>	<ol style="list-style-type: none"> 1. Demonstrate understanding of alterations in normal respiratory physiology and anatomy in chronic obstructive lung disease and their clinical expression. 2. Explain the concept of restrictive and obstructive lung disease
<p>Ascites (Abdominal system) <i>Patient/video/USG</i></p>	<ol style="list-style-type: none"> 1. Demonstrate understanding of alterations in normal physiology and anatomy in portal system and their clinical expression. 2. Observe tests for eliciting presence of fluid in abdomen

<p>Claw hand, Foot drop, Carpal tunnel syndrome (Peripheral nerve injuries) Patient/ video</p>	<ol style="list-style-type: none"> 1. Demonstrate understanding of alterations in normal anatomy & function of these nerves and their clinical expression. 2. Observe tests for eliciting normal function of these nerves
<p align="center">Clinical Context</p>	<p align="center">Outcome</p>
<p>Varicose veins (Venous drainage of the lower limbs) <i>patient/video</i></p>	<ol style="list-style-type: none"> 1. Demonstrate understanding of alterations in normal anatomy and physiology in peripheral venous system and their clinical expression 2. Demonstrate understanding of principles behind clinical examination of varicose veins
<p>Type 2 Diabetes mellitus (T2DM) (Nutrition & Biochemical Lab tests) <i>patient/ Lab investigations</i></p>	<ol style="list-style-type: none"> 1. Demonstrate understanding of alterations in metabolism and physiology in diabetes mellitus and its clinical expression 2. Explain the basis and rationale of biochemical tests done in diabetes mellitus
<p>Obesity (Nutrition) <i>Video/Clinical parameters</i></p>	<ol style="list-style-type: none"> 1. Demonstrate understanding of alterations in Metabolism and physiology in over nutrition and its clinical expression 2. Explain to the population the health risks associated with being overweight/obesity 3. Describe the metabolic and endocrine consequences of obesity.

Annexure II

Examples of deviations from normal, to be observed and noted by the student, when exposed to clinical context.

Example of the Disease / Disorder	Deviations from normal, to be observed and noted by student, when exposed to clinical context. The students should be able to compare abnormal and normal
Cerebellar dysfunction	Tremor, abnormalities of coordination, tone of muscles, findings on elicitation of knee jerk, ocular signs, abnormality in performing alternate rapid movements
Pneumonia	Presence of adventitious sounds on auscultation
Pleural Effusion	Position of mediastinum, findings on percussion, abnormalities of breath sounds
Arthritis	Swelling / Oedema & tenderness in the affected joint, restricted & painful joint movements
Jaundice/Anaemia	Examination for icterus /Pallor- site and colour
Cushing's syndrome	Moon face, hirsutism, striae, buffalo hump

Annexure III

Sample Modules for ECE

ECE Module 1: Acute Myocardial Infarction (AMI)

Setting: Class room

Topic of Basic Science: Coronary Circulation

ECE through- Acute Myocardial Infarction case(Paper based case / Role play)

Goal:

The student must be able recognize the relevance of coronary circulation in diagnosis, patient care and treatment of Acute MI

Expected Competency:

1. Demonstrate understanding of alterations in normal anatomy and physiology of coronary circulation and its clinical expression.
2. Correlate the clinical manifestation in myocardial infarction with altered coronary circulation
3. Explain the basis and rationale of biochemical tests done in myocardial infarction.

Objectives:

At the end of the ECE module I MBBS student shall be able to:

- 1) Describe the mechanism of regulation of coronary circulation.
- 2) Describe the role of lipoproteins in derangement of coronary circulation.
- 3) Explain the biochemical changes occurring in acute myocardial infarction
- 4) Identify the clinical manifestation secondary to decreased coronary circulation.
- 5) Explain the basis of treatment of acute myocardial infarction

Learning Experiences:

Total time: 3 hours

- Introduction and instruction to students: 20 mins.

- Exposure to clinical context and discussion:90 mins
- Summary and conclusion: 10 mins
- Reflection: 30 mins
- Assignment: 30 mins

ECE: Classroom setting: 3 hours

Clinical Context:

A 48 year old company executive experienced a sudden, crushing chest pain, after he returned from his morning walk. His wife noticed that he was pale, sweating profusely and was in distress. She rushed him to the ICU of a nearby hospital immediately. He told the attending physician that on previous occasions too he had felt such pain but he it had subsided with rest. He is known smoker. He also suffers from diabetes, dyslipidemia and hypertension. ECG was taken & it showed ST elevation in leads II, III and AVF. He was admitted in the ICU.

**This clinical scenario can be either used as a paper based case or be performed as a role play if feasible.*

Facilitator's guide:

- *What is the probable reason for the severe pain in chest?*
- *Why did the regulatory mechanisms fail to meet increased demand of Oxygen ?*
- *How are diabetes Mellitus, hypertension and cardiac ischemia related?*
- *What do the changes in ECG indicate?*

Lab report:

Various investigations carried out 4 hours after the onset showed

- Raised cardiac specific troponin T & I
- Raised CK-MB
- Raised Cholesterol (Total, LDL and Triglycerides)

** get an actual lab report copy of a patient of Acute Myocardial infarction admitted at your hospital and use the same taking care not to disclose the identity.*

Facilitator's guide:

- Why are the cardiac Biomarkers raised?
- *What do the serum lipid levels indicate?*
- *What is the role of dyslipidemia in disruption of coronary circulation?*
- *What will be the next steps to manage acute MI?*

Formative assessment:

Submit assignment on the topic anatomical and physiological basis of treatment of acute myocardial infarction.

Reflections can be structured using the following guiding questions

- What happened? (What did you learn from this experience)
- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Program Evaluation:

- ✓ Feedback from students to evaluate for improvements in the module
 1. How helpful has the ECE module been in improving your knowledge about coronary circulation?
 2. Which components of the program helped you to learn?

3. Did the ECE module make learning basic science subjects more interesting?
 4. Are you motivated to read further on this topic as a result of participating in ECE?
 5. Suggest changes in the program that will help you learn still better.
- ✓ Written feedback from the faculty regarding their opinion as to whether outcomes were achieved and suggestions to improve the program

Resources

Appropriate text resources to be identified by the institutional subject experts.

ECE Module 2: Post - Myocardial Infarction Counseling

Setting: OPD

Topic: Coronary Circulation

ECE through- Post -Myocardial Infarction Counseling (**OPD visit**)

Goal:

The student must realize the relevance of basic sciences in patient care and relate to experience of patients as a motivation to learn

Expected Competency:

1. Demonstrate knowledge of process of counseling and communicating to patients with empathy, the dietary modifications and lifestyle changes in post coronary syndromes

Objectives:

At the end of the ECE module I MBBS student shall be able to:

1. Explain the basis of necessary dietary and life style modification to be undertaken in a patient recovering from Acute MI
2. Identify the salient features of effective communication between doctor and patient
3. Realize the impact of illness on patient's life

Learning Experiences:

- Introduction and instruction to students: 20 mins
- Exposure to clinical context: 45 mins
- Discussion: 45 mins
- Summary and conclusion: 10 mins
- Reflections: 30 mins
- Assignment: 30 mins

Part I - OPD setting: 45 mins

The Preclinical departments should arrange rotation of students to the OPD in collaboration with Medicine/ Cardiology / Cardiac Rehabilitation departments. Visits should be arranged in small groups so as to offer a better clinical experience. The clinicians should be made aware of the objectives of module. Patients recovering from Acute Myocardial infarction either treated with medications or interventions can be the focus for learning.

Observation Guide:

Students can be divided to observe different aspects of the doctor patient interaction and share ideas in post-clinic discussion.

Instructions to the students: During the consultation with a post-myocardial infarction patient, observe the interaction carefully.

Observation Guide to group A

Note down the lifestyle and dietary modifications advised by the doctor to prevent reoccurrence of MI.

Observation guide to group B

Observe the communication between the doctor and patient and list all the points in this interaction that helped the patient understand the information being shared. Also list the points that could be done to help the patient further.

Patient Interview:

Encourage one of the students in the group to interview the patient regarding how this illness has impacted his/her life.

Part II: Post clinic discussion: 45 mins

In small groups

- Students observing different aspects will share ideas.
- Facilitator must take care to give an opportunity to all students to voice their observations.

- All points emerging must be noted down on black board/ whiteboard during discussion.
- Facilitator to encourage the students to discuss the reasons for the dietary and life style modification to be undertaken in a patient recovering from Acute MI.
- Facilitator will also discuss the points of effective communication between doctor and patient, focusing on the importance of explaining in a way the patient understands.

This can be linked with module 1.4 of AETCOM - the foundations of Communication-1 and used for introducing or reinforcing the principles of effective communication.

For discussing points of effective communication, the Kalamazoo consensus statement which provides a working model for teaching communication skills can be used.

1. Builds relationship
2. Opens the discussion
3. Gathers information
4. Understands the patient's perspective
5. Shares information
6. Manages flow

The other option is to use the Five A's behavior change model for health behavior change counseling to improve chronic illness care- Assess, Advise, Agree, Assist, Arrange.

- Discuss about how this illness affects the patient's life.
- At the end the student is asked to reflect on the experience and write it down in the log book.

Formative assessment:

- **Clinical skills:** Doctor patient communication can be assessed using Log book to record the patient details in the clinical experience. Reflections about

this patient encounter in the OPD is to be written down by the student and reviewed by teacher-in-charge of ECE.

Reflections can be structured using the following guiding questions

- What happened? (What did you learn from this experience)
- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Program Evaluation:

- ✓ Feedback from students to evaluate for improvements in the module:
 1. How helpful has the ECE module been in improving your knowledge about lifestyle changes post myocardial infarction?
 2. Which components of the program helped you to learn?
 3. Did the ECE module make learning basic science subjects more interesting?
 4. Are you motivated to read further on this topic as a result of participating in ECE?
 5. Suggest changes in the program that will help you learn still better.
- ✓ Written feedback from the faculty regarding their opinion as to whether outcomes were achieved and suggestions to improve the program

Resources:

1. Makoul G. Essential elements of communication in medical encounters: the Kalamazoo consensus statement. Acad Med. 2001; Apr; 76(4): 390-3.
2. Vallis, Michael et al. "Clinical review: modified 5 As: minimal intervention for obesity counseling in primary care" Canadian family physician Medecin de famille canadien vol. 59, 1 (2013): 27-31.

ECE Module 3: Parkinson's disease

Setting: OPD/ Classroom

Topic: Role of Basal Ganglia in Voluntary control of posture and movement

ECE through: Parkinson's disease (actual patient/ video)

Goal:

The student must realize the relevance of basic sciences in patient care and relate to experience of patients as a motivation to learn.

Expected Competency:

1. Demonstrate understanding of alterations in normal functions of Basal ganglia and its clinical expression.

Objectives:

At the end of the ECE module I MBBS student shall be able to:

1. Explain anatomical, biochemical and physiological basis of symptoms and signs of Parkinson's disease
2. Explain the difference between pyramidal and extrapyramidal lesions
3. Observe the examination of motor system

*Please note that teaching-learning of the clinical skills must be supplemented by a DOAP session (Demonstrate Observe Assist Perform) on examination of Motor system or preceded by it, as feasible, so that the student is able to demonstrate the correct clinical examination of the motor system ultimately.

Learning Experiences:

- Introduction and instruction to students: 20 mins
- Exposure to clinical context and Discussion: 90 mins
- Summary and conclusion: 10 mins
- Reflections: 30 mins
- Assignment: 30 mins

ECE: Classroom setting: 3 hours

Actual patient/simulated patient with Parkinson's disease can be invited to the classroom or a video recording of the history and physical examination can be shown to the students as per feasibility.

Observation Guide:

Instructions to the students:

- During the consultation, listen carefully to the patient's complaints. Note the onset, duration and progress of these symptoms.
- Observe the physical examination carried out and note down the salient features of the examination.
- Try to find an explanation for his/her symptoms and signs.

Part II: Post clinic discussion: 1 hr

In small groups:

- Students will share their observations
- Facilitator must take care to give an opportunity to all students to voice their observations.
- All points emerging must be noted down on black board/ whiteboard during discussion
- Facilitator discusses the patient's history –onset of tremors and parts affected history of falls, poor balance, muscle stiffness, drooling of saliva, difficulty in writing, loss of memory along with change in voice and the basis of signs like: mask-like face, pill rolling movement, festinant gait and cog wheel rigidity.
- Facilitator also discusses the technique of examination of tone in the patient.
- At the end, the student is asked to reflect on the experience and write it down in the log book.

Formative assessment:

Basic Science correlation: To be assessed on the basis of assignment on 'Treatment options for the Shaking Palsy'

Reflections can be structured using the following guiding questions:

- What happened? (What did you learn from this experience)
- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Program Evaluation:

- ✓ Feedback from students to evaluate for improvements in the module
 1. How helpful has the ECE module been in improving your knowledge about Parkinson's disease?
 2. Which components of the program helped you to learn?
 3. Did the ECE module make learning basic science subjects more interesting?
 4. Are you motivated to read further on this topic as a result of participating in ECE?
 5. Suggest changes in the program that will help you learn still better.
- ✓ Written feedback from the faculty regarding their opinion as to whether outcomes were achieved and suggestions to improve the program

Resources:

Appropriate text resources to be identified by the institutional subject experts.

ECE Module4: Varicose Veins

Setting: Classroom & OPD

Topic of Basic Science: Front of Thigh / Veins of Lower limb

ECE through- Varicose vein case (Video / Patient)

Goal:

The student must be able recognize the clinical manifestations of altered anatomy of venous system.

Expected Competency:

1. Demonstrate understanding of alterations in normal anatomy and physiology in peripheral venous system and its clinical expression
2. Demonstrate understanding of principles behind clinical examination of Varicose veins

Objectives

1. Discuss the clinical manifestation of impaired venous drainage in Lower limb
2. Explain the basis of treatment of Varicose veins

Learning Experiences:

- Introduction and Instruction to students: 20 mins
- Exposure to clinical context and discussion: 90 mins
- Summary and conclusion: 10 mins
- Reflections: 30 mins
- Assignment: 30 mins

**ECE: Classroom setting: 3
hours**

A 40-year old male, bus conductor noted dilated engorged tubular structures over his calf and thigh region. These were becoming prominent after a long time standing posture.

****This clinical scenario can be used as either, a paper based case supplemented by video or on actual patient if feasible.**

Facilitators guide:

- *What are these dilated engorged tubular structures?*
- *Why do these develop in lower limb only?*

Clinical Examination:

Trendelenburg's test and other clinical tests

****Perform Trendelenburg's test on actual patient, if available.**

Facilitators guide:

- *What are the steps to perform Trendelenburg's test? What is anatomical basis for these tests?*
- *Which veins can be tested by this method and why?*
- *What will be the steps to manage varicose veins?*

Formative assessment:

- Structured Long answer question on veins of lower limb
- OSCE for demonstration of Trendelenburg's test
- Submit assignment on the topic medical and surgical basis of treatment of varicose veins.

Reflections can be structured using the following guiding questions:

- What happened? (What did you learn from this experience)

- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Program Evaluation:

- ✓ Feedback from students to evaluate for improvements in the module
 1. How helpful has the ECE module been in improving your knowledge about varicose veins?
 2. Which components of the program helped you to learn?
 3. Did the ECE module make learning basic science subjects more interesting?
 4. Are you motivated to read further on this topic as a result of participating in ECE?
 5. Suggest changes in the program that will help you learn still better.
- ✓ Written feedback from the faculty regarding their opinion as to whether outcomes were achieved and suggestions to improve the program

Resources

Appropriate text resources to be identified by the institutional subject experts.

ECE Module 5: Type 2 Diabetes mellitus (T2DM)

Setting: Class room /OPD

Topic of Basic Science: Carbohydrate Metabolism

ECE through: Type 2 Diabetes Mellitus Case (Role play/ Paper based case/ actual Patient)

Goal: The student must be able recognize the clinical manifestations of altered carbohydrate metabolism

Expected Competency

1. Demonstrate understanding of alterations in metabolism and physiology in diabetes mellitus and its clinical expression
2. Explain the basis and rationale of biochemical tests done in diabetes mellitus

At the end of the ECE module I MBBS student shall be able to:

1. Explain the significance of estimating Blood glucose level, urine glucose and ketone bodies and HbA1c
2. Discuss the role of HbA1c in management of diabetes mellitus
3. List the guidelines to collect blood sample for glucose estimation
4. Interpret the results of the Blood glucose test, Urine glucose,urine ketones and HbA1c
5. Demonstrate the use of glucometer to estimate blood glucose level

Learning Experience:

Total 3 hours

1. Introduction & Instruction 20 mins
2. Exposure to clinical content and discussion in small groups 60 mins
3. DOAP - use of glucometer for estimating blood sugar level 30 mins
4. Summary & Conclusion 10 mins
5. Reflection &Assignment 30 mins

ECE Classroom setting:3 hours

Mr. Shukla, a 45 year old businessman was happy that he had lost 4 kg weight in last 2 months. He felt he was losing weight as he had started drinking more water than usual though he kept feeling hungry all the time. Maybe getting up at night too to empty his bladder was disturbing his sleep and made him feel tired all through the day.

His physical examination and lab investigations carried out as part of the yearly health checkup showed the following significant findings:

BMI: 28

Fasting Plasma Sugar: 180 mg/dl

Urine Sugar: absent

Postprandial Plasma Sugar: 230 mg/dl

Urine Sugar: +

Urine ketones: absent

HbA1c: 7.9 %

He was asked to follow up with a physician so he has come to your OPD.

**Perform this clinical scenario as a role play. You may distribute copies of a mock lab report to aid discussion.*

Facilitator's Guide:

- *Explain what is happening with Mr.Shukla. What are alterations in normal physiology/ biochemistry that can explain clinical presentation of Mr. Shukla?*
- *Why is urine sugar absent in fasting sample?*
- *Explain the significance of raised HbA1c and high BMI in a patient of Type 2 DM*
- *Why should the blood sample for glucose be collected in fluoride -EDTA bulb or tube (grey).*

The facilitator will then have a DOAP session (Demonstrate Observe Assist Perform) on use of glucometer to estimate blood glucose levels

Formative assessment:

Basic Science correlation: To be assessed on the basis of assignment on 'Diabetes - A metabolic disorder'

Reflections can be structured using the following guiding questions:

- What happened? (What did you learn from this experience)
- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Program Evaluation:

- ✓ Feedback from students to evaluate for improvements in the module
- ✓
 1. How helpful has the ECE module been in improving your knowledge about disorders of carbohydrate metabolism?
 2. Which components of the program helped you to learn?
 3. Did the ECE module make learning basic science subjects more interesting?
 4. Are you motivated to read further on this topic as a result of participating in ECE?
 5. Suggest changes in the program that will help you learn still better.
- ✓ Written feedback from the faculty regarding their opinion as to whether outcomes were achieved and suggestions to improve the program

ECE Module 6: Acid -Base Disorder

Setting: Class room & Clinical Biochemistry Laboratory

Topic of Basic Science: Acid -Base Balance

ECE through: Acid -Base Balance Disorder Case (paper based case)

Goal: The student must be able recognize the clinical manifestations of altered acid base balance

Expected Competency:

1. Describe the processes involved in maintenance of normal pH of body fluids and the derangements associated with these.
2. Discuss and interpret results of Arterial Blood Gas (ABG) analysis in various disorders.
3. Observe use of ABG analyzer.

At the end of the ECE module I MBBS student shall be able to:

1. Explain the basis of the biochemical changes noted due to compensatory mechanisms in various acid base disorders.
2. Describe the use of ABG analysis and Serum electrolyte values in diagnosis of acid base disorders.
3. Describe and interpret the results of the ABG analysis in the different types of Acidosis and Alkalosis.
4. Describe the Principle of Arterial Blood Gas (ABG) analyzer

Learning Experience:

Total 3 hours

- | | |
|--|-------------|
| 1. Introduction & Instruction - | 15 mins |
| 2. Exposure to clinical content and Discussion | 1hr 30 mins |
| 3. Demonstration of working of ABG analyzer | 30 mins |

- | | |
|-------------------------|---------|
| 4. Summary & Conclusion | 15 mins |
| 5. Assignment | 30 mins |

ECE Classroom setting: Objectives 1-3 can be achieved with the help of the following case and Objective 4 can be demonstrated in the Clinical Biochemistry Laboratory.

Part 1:

Mrs. Rajashree is a 45 year old teacher. She was suffering from severe diarrhea for the last 5 days. The stools were watery and copious. She also complained of fatigue and shortness of breath since morning.

Facilitator’s Guide:

- *What is the critical course of events that will alter her acid base status?*
- *What acid base abnormalities would you expect in her based on above information?*
- *What physical findings would you expect from this acid base disturbance?*

Part 2:

Her blood reports were as follows:

Fasting Blood Sugar: 100 mg/dl	PaCO ₂ : 30 mmHg
pH: 7.24	Cl ⁻ : 106 meq/L
HCO ₃ ⁻ : 15 meq/L	Na ⁺ 134 meq/L
	K ⁺ : 4.2 meq/L

Facilitator’s Guide:

- *Review the Biochemical report. What is the primary abnormality? How did you decide that?*
- *What are alterations in normal physiology/ biochemistry that can explain clinical presentation of Mrs. Rajashree ?*
- *Is the compensatory response observed?*
- *Calculate the anion gap and interpret the findings.*

Part 3:

Laboratory Visit:

The students to observe the working of an ABG analyser in the Laboratory

Facilitator's Guide:

- Facilitator will demonstrate the working of an ABG analyzer and explain its principle.

Formative Assessment:

Students can be given various ABG reports to interpret and explain the compensatory response that would occur.

Reflections can be structured using the following guiding questions:

- What happened? (What did you learn from this experience)
- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Programme Evaluation:

- ✓ Feedback from students to evaluate and modify program
 1. How helpful has the ECE module been in improving your knowledge about Acid- Base disorders?
 2. Which components of the program helped you to learn?
 3. Did the ECE module make the basic science subjects learning more interesting?
 4. Are you motivated to read further on this topic as a result of participating in ECE?
 5. Provide suggestions to improve leaning further.
- ✓ Written feedback from the faculty regarding their opinion as to whether outcomes were achieved and suggestions to improve the program

Annexure IV

Humanities Module

Study of medical humanities plays a pivotal role in preparing students to practice in the community. It develops the students' capacity to listen, interpret and communicate with patients. Appreciating the subjective aspects of a person's health and illness will enable them to offer individualised care. It will also provide a channel to the students to express themselves through creative mediums of literature, music and arts.

Literature and Medicine

Background

Medicine is an integral part of literature - classic popular and science fiction. A whole genre of medical fiction exists which reflects the community's view of the medicine, its system and health care workers. Literature also portrays human suffering and gives learners perspectives quite different from that obtained from teachers. Many doctors are prolific writers and have written about personal suffering as well as the impact of medicine. The module allows the learner to explore medicine and human suffering from a literary perspective.

Competency addressed

The learner must explore, discuss and reflect on human illness suffering and medicine as portrayed in literature (classic/contemporary)

Learning Session

Year of Study: 1

Hours: 8 hours

Exploratory session: 2 hours

Self-directed Learning: 4 hours

Research / Task / Report

Discussion and closure: 2 hours

Description:

1. An exploratory session is created where either in small groups or an interactive large group, students are allowed to speak about the portrayal of suffering illness and health care workers and the system as portrayed in classic and contemporary literature. Evoke questions about regional literature in particular. Explore differences in portrayal of doctors in classic vs. contemporary literature. Evoke a discussion about doctors accounts of their own suffering
2. Students, individually or in groups, are asked to choose and read and report on a book that has affected their view of the illness, suffering or the medical profession
3. **Discussion and closure:** A closure session where students share their reflection based on their tasks and learnings and their implications

Assessment

Submitted Narrative and reflections

Annexure V

Clinical vignettes for short answer questions

Sample 1

A 55 year old man complained to his general practitioner that he felt tired easily. He also complained of dizziness, sweating and palpitations after meals. He had undergone partial gastrectomy seven years ago involving removal of major part of body and fundus of the stomach. Since last 2.5 years he had stopped taking Vit B₁₂ injections.

Q. Explain the physiological basis of:

- a. Need of Vit B₁₂ injections after partial gastrectomy involving fundus and body of stomach.
- b. Symptoms of dizziness, sweating and palpitations observed after a meal in this patient.

Sample 2

A 35 year old male patient reports to the out-patient department with complaints of increasing stretch marks and muscular atrophy. He also complained of increased weight gain especially on the upper back area.

Q.a. Explain the biochemical features **expected** in this patient.

Q.b. Explain the biochemical basis of the tests used to confirm and further evaluate the cause of this condition.

Sample 3

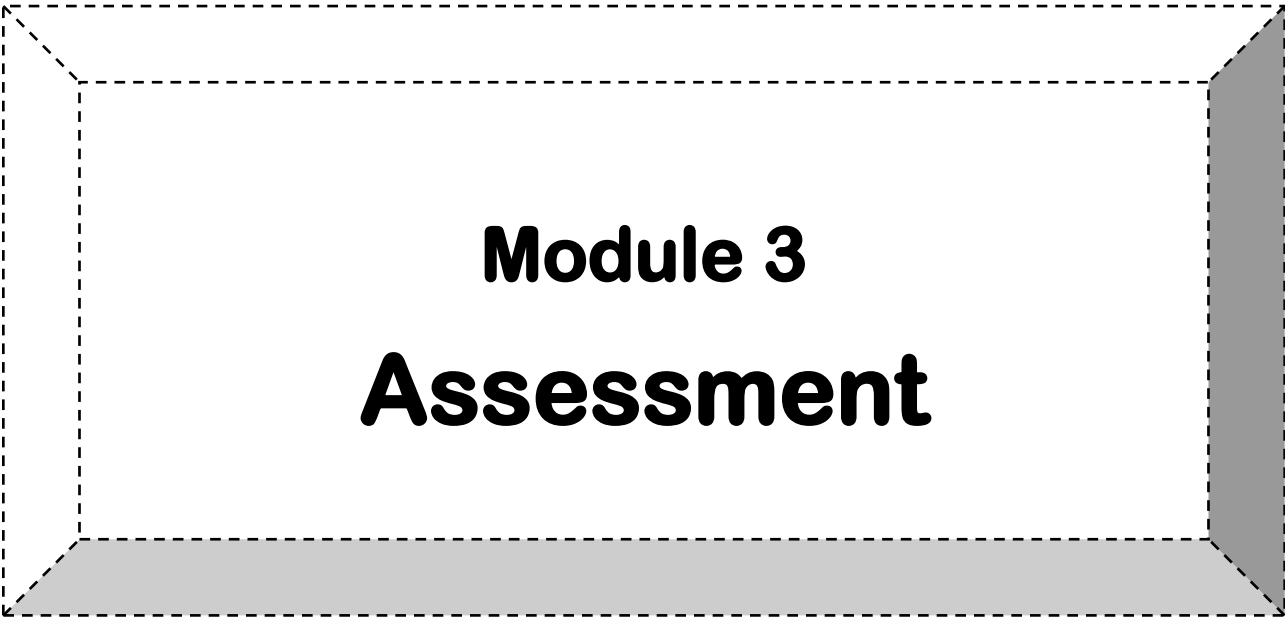
A patient with a diagnosis of leprosy came to the hospital with complaints of absence of sensation in right hand. Clinical examination showed sensory loss in medial one and half finger & medial side of palmar-dorsal aspects of right hand. There was also flattening of hypothenar eminence & difficulty in holding paper tightly between the affected fingers on right side.

Q.a. Mention the affected structure.

Q.b. Describe branches and area of distribution of the affected structure in hand.

Q.c. Explain the anatomical basis of flattening of hypothenar eminence.

Q.d. Explain the difficulty in holding of paper tightly between fingers on right side.



Module 3
Assessment



MEDICAL COUNCIL OF INDIA

COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE

Knows Knows how Shows Shows how Performs



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**Competency Based Assessment
Module for
Undergraduate Medical Education
2019**



**Medical Council of India
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अध्यक्ष

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Foreword

A popular maxim in education is - if it is not assessed it is not learnt. The introduction of a competency based curriculum makes assessment a crucial element of learning. Indeed, the emphasis on competencies makes assessment of its attainment and maintenance a prerequisite. Assessment must serve both to provide the continued input on the progress of the learner that will allow him or her to calibrate and improve and also to ensure that only the learner with the right set of knowledge, skills and attitude is allowed to be admitted into the profession and to provide patient care.

The introduction of a competency based curriculum necessitates structured formative assessment, periodic internal assessment and end of phase summative assessment with appropriate and effective feedback built in. In addition, a mechanism to assess and document competency and skill acquisition needs to be in place. Workplace based assessments need to be introduced to the extent possible keeping in mind the roll out of the student doctor program.

The task at hand is complex and requires extraordinary collaboration between teachers, institutions and Universities. This booklet attempts to align the needs of institutions, Universities, learners and teachers with assessment of competencies in the new MBBS curriculum. It has been prepared by invited experts who have worked along with the Expert group for curriculum appointed by the Board of Governors in supersession of the Medical Council of India.

The booklet provides clarity and guidelines that will be useful in the development and implementation of assessment in the competency based environment. There is an increased emphasis on assessment of outcomes through alignment with objectives. Also provided are ideas and strategies for meaningful formative and summative assessment. Summative assessment is the domain of the Universities; however, this booklet provides some principles that Universities can adopt while aligning the examinations to the curriculum that the learners will undergo.

I am grateful to the authors and the expert group who have made this booklet possible. Suggestions for improvement are most welcome. Institutions and Universities are encouraged to share their best practices so that we can all learn together and help bring out better doctors who will be an asset to the community that they serve and to the nation as a whole.

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MEDICAL COUNCIL OF INDIA
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IN SUPERSESSION OF MEDICAL COUNCIL OF INDIA

Foreword

This booklet provides a suggested pattern for Competency Based Assessment for the MBBS program commencing 2019. Summative assessment is the domain of the Universities to whom medical colleges are affiliated. Some changes will be required in the way that learners are tested to meet the requirements in the competency based curriculum. In addition, Competency Based Assessment places increased emphasis on formative and internal assessment. This booklet addresses the needs of institutions, Universities and teachers and is aimed at recalibrating the approach to assessment under the auspices of the new curriculum. The booklet is in alignment with the Regulations in Graduate Medical Education, 2019 Part II document.

This booklet has been developed by experts invited by the Board of Governors in supersession of the Medical Council of India and incorporates their vast expertise and experience. The Board of Governors in supersession of the Medical Council of India acknowledges their time and effort in creating this guide that can be used by institutions to develop their own learning process and content. Appreciation is also due to the efforts of the Academic Cell and faculty at the various Regional and Nodal centres who continue to work tirelessly to ensure that the new competency based curriculum and its various unique components are implemented faithfully and flawlessly across the medical colleges in this country. This will best serve the needs of the country and the cause of medical education.

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Curriculum Implementation Support Program

Module–3

Competency Based Assessment

Guidelines for Competency Based Assessment

1. Objectives of the Document

To help the reader to:

- Understand the role and place of assessment in new competency based curriculum
- Understand the changes in assessment as per new curriculum.
- Understand the differences between the traditional assessment and Competency Based Assessment (CBA).
- Understand the components of competency based assessment.
- Understand the tools for competency based assessment.
- Understand the role of feedback in assessment.
- Plan, develop and implement CBA in the colleges and universities.

2. Glossary of terms used in the document

Summative assessment (University examination)	An assessment conducted at the <i>end of instruction</i> to check how much the student has learnt.
Formative assessment	An assessment conducted <i>during</i> the instruction with the primary purpose of providing feedback for improving learning.
Internal assessment	Range of assessments conducted by the teachers teaching a particular subject with the express purpose of knowing what is learnt and how it is learnt. Internal assessment can have both formative and summative functions.

Validity	Degree to which the inferences drawn from assessment are supported by empirical evidence or theoretical rationale.
Reliability	Degree of confidence that can be placed in the results. Depending on the context, it can be in terms of precision, consistency or reproducibility.
Competency	An observable activity of the health professional with a judicious and consistent mix of knowledge, skills, attitudes and communication.

3. Introduction

Competency based education has been defined as an outcome-based approach to the design, implementation, assessment and evaluation of a medical education program using an organizing framework of competencies.¹ Much more than a different style of teaching, competency based curriculum obligates a vastly different perspective on assessment. It mandates greater emphasis on setting up an ongoing and longitudinal assessment so that teachers can diagnose the stage of the learner and identify whether they need further or different learning opportunities to acquire competency. Assessment in competency based curriculum plays a crucial role in its implementation.

Competency is not an all or none phenomenon. Rather it is incremental. The role of teachers is to help the learner acquire and improve upon the competencies. Competency based curriculum moves away from time bound education and looks at competency as the end point. Consequently, we are no longer interested in demonstration of discrete behaviours by the learners; rather we are interested in application of these in each patient context. Thus, it is more about integration of the required knowledge, skills and attitudes rather than anyone of them in isolation. Therefore assessment in competency based curriculum also needs to be integrated as far as feasible.

4. Purpose of assessment in competency based curriculum

While an obvious purpose of assessment in competency based curriculum is to help the teachers decide if the students have acquired the desired competencies, an equally important purpose is to help the students acquire and improve their competencies. Quality assurance also requires quality assessment.

Major characteristics of competency based assessment are their longitudinal nature, provision of developmental feedback and authentic settings, all of which result in lowering the stakes on individual assessments. This has other important implications also for assessment design. Since the stakes are low and purpose is to improve learning, high standardization and psychometric rigor is not required. Authenticity of assessment task is more important than its structure or objectivity. Expert subjective judgment plays a major role in assessment of competencies.

The difference in perspective stems from three important characteristics of competency based curriculum. First, that by definition, teaching and assessment has to be in the *context* of competencies. Second, that discrete assessment of knowledge, skills and attitudes may not always add up to a competency. Third, and probably the most important, that there is a high context specificity in assessment. Performing competency 'A' well does not mean that the student can perform the competency 'B' also as well. Similarly, assessment in demonstration room may not be the same as assessment at the bedside. Moreover, many competencies like communication, team work, sincerity etc. may not be amenable to reliable assessment if done sparingly. Therefore, all competencies need to be assessed multiple times and in different contexts. An implication of this is that only one summative or end of year examination is not suited for this purpose.

Utility of assessment is traditionally expressed as a notional concept represented as using a product of validity, reliability, acceptability, feasibility and educational impact.² For CBA, validity and educational impact are the major determinants of its utility. Despite subjective judgments being involved, their reliability can be improved by increasing the number of assessors, assessments, tasks and by involving all teachers of the department in CBA process. This is a

simple intervention to not only take care of subjectivity but also to improve ownership of teaching-learning and assessment.³

5. How does CBA differ from traditional assessment?

Traditional assessments are easy to design, administer, score and analyse compared to CBA but may not be able to provide complete information about the stage of the student. Traditional assessments are snap shot observations of learning, are generally not linked to instructions or outcomes and *promote test taking behaviour*. They are fragmented and mainly focus on knowledge (sometimes skills). CBA, on the other hand, provides more comprehensive information about not only the current stage of the student but also about his progression and ascendancy. They are longitudinal, often with low stakes and help to reduce examination anxiety. CBA is based on direct observation and therefore helps in generation of authentic feedback, which helps the students to learn better. This concept of *assessment for learning* is crucial for the acquisition of competencies.

Competency based assessment should help in collecting and analysing evidence to decide if a student is competent in relation to a required competency and in relation to his/her stage of training. The underlying concept of competency – i.e. the *habitual and consistent* use of knowledge, technical skills, clinical reasoning, communication, emotions, values and reflection in daily practice for the benefit of the individual and the community being served, again demands that the student should consistently demonstrate the desired behaviour rather than only during the final examination.

Competency based assessment aids in the process of learning. Effective feedback is paramount to helping learners improve. CBA is an ongoing process so that any deviation in learning can be recognized early and taken care of by providing formative feedback. This concept is crucial and aligns very well with the basic principles of competency based medical education viz. active involvement of the learner, creating an authentic environment for learning, direct observation and provision of formative feedback. CBA requires active participation of the trainee in the form of self-assessment and reflections.⁴ The paradigm is reflected in figure 1.⁵

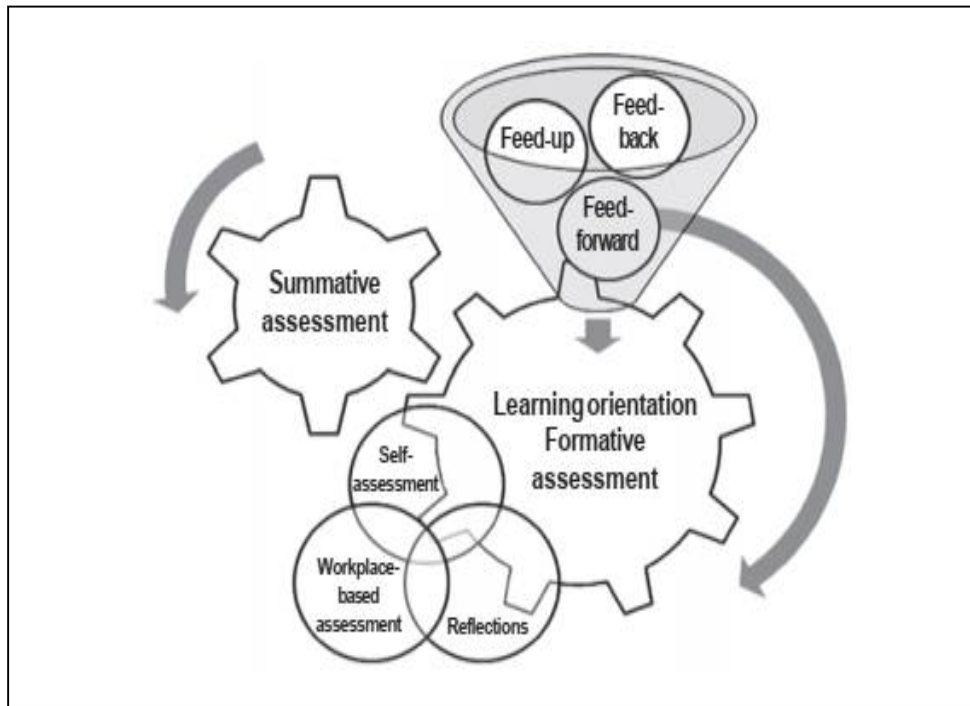


Figure 1. Paradigm of medical student assessment ⁵

(Reproduced with permission from National Medical Journal of India)

Medical education literature distinguishes between competence (ability to do) and performance (actually doing). In terms of Miller's pyramid, competence would fall under the 'shows' category while performance falls under 'does'.⁶ For the undergraduate students, most of the assessment would be up to 'shows' level. Since they are not authorized to independently take care of the patient or are not directly in charge of patient care, targeting the 'does' level will pose logistic difficulty.

6. What should be assessed?

Assessment requires specification of measurable and observable entities. This could be in the form of whole tasks that contribute to one or more competencies or assessment of a competency *per se*. Another approach is to break down the individual competency into learning objectives related to the domains of knowledge, skills, attitudes, communication etc. and then assess them individually. However, as stated earlier, using individual domain framework may not always result in making an accurate assessment of the specific competency. Therefore, efforts should be made to include competencies in the assessment process as much as possible. CBA is very useful to convey a message to the students to structure their learning around competency framework.

The assessment opportunities can be broadly divided into ongoing and term end. While the term end examinations (Summative assessment) will usually be conducted by the Universities, the ongoing assessments are conducted by the teachers teaching the subject and can be both formal and informal.

The summative assessment e.g. university examinations at the end of professionals, are used for pass or fail decision. The purpose of such assessments is to sample the learning and ensure quality. Since all competencies should be assessed, summative assessments alone are not the option for CBA. For logistic reasons, competencies like communication, team work, ethics, professionalism and many procedural skills are also not assessable at term end examinations.

Ongoing assessment provides many options for this purpose. A blueprint may be needed to decide which competencies should be assessed during internal assessment and which should go to summative or University examinations. Informal assessments should happen during teaching-learning activities with the express purpose of finding out the stage of the student and taking corrective action in teaching-learning methodology on an ongoing basis. During lectures, small groups or seminars, use of techniques like clickers, one-minute papers and muddiest point provide valuable information to check understanding and provide developmental feedback.⁷ Same can be done during practical/clinical teaching using one-minute preceptor (OMP) or SNAPPS technique (Summarize history and findings, Narrow the differential; Analyze the differential; Probe preceptor about uncertainties; Plan management; Select case-related issues for self-study).⁸⁻¹⁰ Many of these do not need to be considered for pass/fail decisions but are useful to aid learning and acquire competencies. These can be planned by the teachers on a day to day basis and modified depending on the tasks at hand.

Features of Competency Based Assessment (CBA)

- CBA operates within the framework of competencies. Assessment tools should align competencies/objectives.
- CBA should help to acquire competencies/objectives (*Assessment for learning*) and their certification (*Assessment of learning*).
- CBA is continuous and ongoing process with opportunities for providing developmental feedback.
- Direct observations of students improve utility of CBA and feedback.
- Multiple assessors, multiple tools and multiple assessments improve the validity and reliability of CBA.

7. Formative & Internal Assessment (IA)

Formative assessment is an assessment conducted during the instruction with the primary purpose of providing feedback for improving learning. It also helps the teachers and learners to modify their teaching learning strategies. The feedback is central to formative assessment and is linked to deep learning, seeking to explore the educational literature and its pedagogical lessons for healthcare educational practice. It provides inputs to both students and teachers regarding adequacy of teaching-learning.¹⁰ A variety of feedback principles and techniques can be used depending on the context.^{11, 12}

Although there can be a debate on the summative or formative nature of IA, it still provides the best opportunities for formative purposes. IA is when assessment is done by the teachers who have taught the subject. It overcomes the limitations of day-to-day variability and allows larger sampling of topics, competencies and skills.

In competency based curriculum, IA provides useful avenues for both formative and summative assessment. The IA focuses on the process of learning i.e. how the students have learnt throughout the course. This assessment gives priority to psychomotor, communication and affective domains. These are those domains which are usually not assessed by the traditional assessment methods. It should involve all faculty members of a department (Senior Residents upwards) and not just one or two senior teachers. This helps to build the ownership of teaching-learning

and assessment as well as provide ‘hands-on’ experience in assessment to all teachers. In that way, IA can be a very useful tool for assessing all competencies in any competency based curriculum.

IA should not be considered as an assessment without external controls and can be utilized in a manner to overcome some its perceived weaknesses. Utility of IA can be further improved by involving all teachers in the department and limiting the contribution of individual teacher, test or tool.¹²

8. Designing a system of assessment

While designing an internal assessment, all domains of learning i.e. cognitive, psychomotor and affective should be taken into account and weightage should be assigned to these domains for assessment. We can divide various domains into smaller components and assign marks to each component. Make a blueprint of assessment, then circulate to few students and faculty, take their comments/ views/feedback and revise as per the need.

Miller’s pyramid (figure 2) provides a simple way to select appropriate tool for assessment. Efforts should be made to climb higher in the pyramid.^{6, 13} The following adapted example illustrates this:

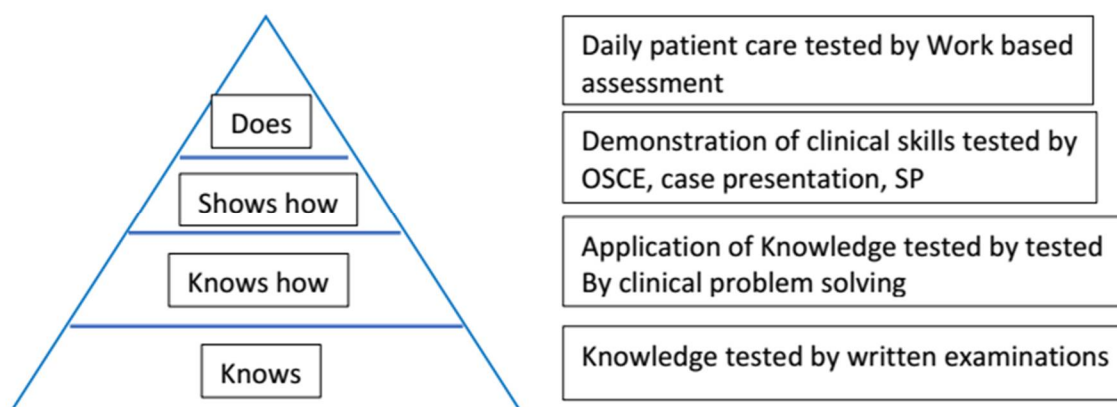


Figure 2. Assessment methods as per levels of competency (Adapted from Ramani)¹³

OSCE: Objective Structured Clinical Examination, SP: Standardised/ Simulated Patients

The key to building validity and to make CBA assessment useful is to align it with competencies/objectives. Including some aspects from competencies of other

phases is useful to assess integration of concepts. Some examples of such alignment can be seen in the competency sheet given in Table1.

Table 1. Deriving assessment methods from objectives

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

PA42.3	Identify the etiology of meningitis based on given CSF parameters	K/S	SH	Y
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Objective: Statement of what a learner should be able to do at the end of a specific learning experience

PA42.3.1	At the end of the session the PII student must be able to enumerate the most common causes of meningitis correctly	Short note or part of structured essay: Enumerate 5 causes of meningitis based on their prevalence in India
PA42.3.2	At the end of the session the PII student must be able to enumerate the components of a CSF analysis correctly	Short note or part of structured essay: Enumerate the components tested in a CSF analysis
PA4.3.3	At the end of the session the PII student must be able to describe the CSF features for a given etiologic of meningitis accurately	Short note or part of structured essay: Describe the CSF findings that are characteristic of tuberculous meningitis
PA4.3.4	At the end of the session the PII student must the able to identify the aetiology of meningitis correctly from a given set of CSF parameters	Short note / part of the structured essay/ Skill station/ Viva: Review the CSF findings in the following patient and identify (write or vocalise) the most likely ethology

A useful approach, especially for affective, psychomotor and communication domains, is to adopt the concept of *assessment toolbox*. A toolbox is a listing of available tools (and rating forms, if required), which are suggested for a particular competency or sub-competency and aims at improving the value of assessment data.¹⁴ The listed tools are suggestions only and can be freely used either singly or in combination by teachers to suit particular requirements. Efforts should be made to use multiple tools even for a given competency to improve validity and reliability of assessment.

While assessment will continue to be subject based, efforts must be made to ensure that phase appropriate correlates are assessed to determine if the learner has internalised and integrated the concept and its application.

a. Internal Assessment logistics

Scheduling of IA

A proposed schedule of tests for IA is given in **Annexure 1**. An end of posting clinical assessment shall be conducted for each clinical posting in each professional year. Prior to university examinations, departments can conduct additional tests as and when required with the purpose of providing formative feedback to the students. In subjects that are taught at more than one phase, proportionate weightage must be given for internal assessment for each Phase. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently. A student who has not taken minimum required number of tests for IA each in theory and practical will not be eligible for University examinations. Proper records of the work should be maintained which will form the basis for the students' internal assessment and should be available to the assessors at the time of inspection of the college by the Medical Council of India.

Components of IA

- (i) Theory IA can include: theory tests, send ups, seminars, quizzes, interest in subject, scientific attitude etc. Written tests should have short notes and creative writing experiences.
- (ii) Practical/Clinical IA can include: practical/clinical tests, Objective Structured Clinical Examination (OSCE)/Objective Structured Practical Examination (OSPE), Directly Observed Procedural Skills (DOPS), Mini Clinical Evaluation Exercise (mini-CEX), records maintenance and attitudinal assessment.

Colleges and teachers should try to build capacity to use a variety of assessment tools. A number of tools are available in the form of assessment toolbox.¹⁴ The construct validity and predictive utility of internal assessment is high.¹⁵

Many of the tools mentioned for IA may appear subjective. However, by virtue of being high on *validity* and by conveying a message to the students to not ignore

skills, attitudes and communication (*educational impact*), they contribute to better learning. Since stakes at IA are low, the use of expert subjective assessments to cover areas which are not assessable by conventional objectivised assessment tools is appropriate. There is plenty of evidence in literature to suggest that expert subjective assessments can be as reliable as highly objective ones.¹⁶

The IA of broader specialties should also include marks from all the allied specialties e.g. General Medicine should include marks of Psychiatry, Dermatology, Venereology & Leprosy and Respiratory Medicine including tuberculosis etc. while General Surgery should include Orthopaedics, Dentistry, Anaesthesiology and Radio-diagnosis etc. so that students do not ignore these postings. The proportion of the marks for each allied specialty shall be proportionate to the time of instruction allotted to each. It may be noted that although very small contribution is being made by allied subjects, yet it serves as motivator to the students to not miss these postings. When subjects are taught in more than one phase - the assessment must be done in each phase and must contribute proportionally to final internal assessment.

Assessment of Foundation Course should be included in formative assessment of first phase. Assessment of Early Clinical Exposure should be included in formative as well as in internal assessment in first phase subject-wise. Assessment of electives should contribute to internal assessment in final phase part-2. *There should be at least one assessment based on direct observation of skills, attitudes and communication at all levels.* Communication and attitudinal assessment should also be built in all assessments as far as possible. A log book must be used to record these components. A sample format of log book is being published separately.

Feedback in IA

Feedback should be provided to students throughout the course so that they are aware of their performance and remedial action can be initiated well in time. The feedbacks need to be structured and the faculty and students must be sensitized to giving and receiving feedback.^{11,12}

The results of IA should be displayed on notice board within 2 weeks of the test and an opportunity provided to the students to discuss the results and get feedback on making their performance better. Universities should guide the colleges regarding formulating policies for remedial measures for students who are either not able to score qualifying marks or have missed on some assessments due to any reason(s).

It is also recommended that students should sign with date whenever they are shown IA records in token of having seen and discussed the marks. **Internal assessment marks will not be added to University examination marks and will reflect as a separate head of passing at the summative examination.**

These concepts have been incorporated in the proposed Regulations in Graduate Medical Education, 2019 (GMER 2019) and are reproduced below:

Excerpts from proposed GMER 2019

11.1.1 (b) Internal Assessment: Internal assessment shall be based on day-to-day assessment. It shall relate to different ways in which learners participate in learning process including assignments, preparation for seminar, clinical case presentation, preparation of clinical case for discussion, clinical case study/problem solving exercise, participation in project for health care in the community, proficiency in carrying out a practical or a skill in small research project, a written test etc.

1. Regular periodic examinations shall be conducted throughout the course. There shall be no less than three internal assessment examinations in each Preclinical / Para-clinical subject and no less than two examinations in each clinical subject in a professional year. An end of posting clinical assessment shall be conducted for each clinical posting in each professional year.
2. When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.
3. Day to day records and log book (including required skill certifications) should be given importance in internal assessment. Internal assessment should be based on competencies and skills.
4. The final internal assessment in a broad clinical specialty (e.g., Surgery and allied specialties etc.) shall comprise of marks from all the constituent specialties. The proportion of the marks for each constituent specialty shall be determined by the time of instruction allotted to each.
5. Learners must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in a particular subject in order to be eligible for appearing at the final University examination of that subject. Internal assessment marks will reflect as separate head of passing at the summative examination.
6. The results of IA should be displayed on the notice board within a 1-2 week of the test. Universities shall guide the colleges regarding formulating policies for remedial measures for students who are either not able to score qualifying marks or have missed on some assessments due to any reason.
7. Learners must have completed the required certifiable competencies for that phase of training and completed the log book appropriate for that phase of training to be eligible for appearing at the final university examination of that subject.

Record keeping

The peculiarities of CBA, particularly its longitudinal nature and its use as a measure of progression, require a good record keeping. Such records can vary from manual to electronic. In whatever form they are used, the essential features should include regularity, availability to the students and a documentation of discussion of results (present status, feedback and suggestions for improvement) between the student and the teacher(s). Many aspects can be covered in a group feedback while some will require one to one discussion. The formats for use in Indian settings have been published and can be suitably modified for local use.¹²

b. Summative assessment logistics (For Universities)

Summative assessment consists of University examinations. Each theory paper will have 100 marks. Marks distribution for various subjects is given in Table 2.

Table 2: Marks distribution for various subjects in University examinations

Phase of Course	Written-Theory – Total	Practicals / Orals/ Clinicals	Pass Criteria
First Professional			<u>Internal Assessment:</u>
Human Anatomy - 2 papers	200	100	50%combined in theory and practical (not less than 40% in each) for eligibility for appearing
Physiology - 2 papers	200	100	
Biochemistry - 2 papers	200	100	
Second Professional			for University Examinations
Pharmacology - 2 Papers	200	100	<u>University Examination</u>
Pathology - 2 papers	200	100	
Microbiology - 2 papers	200	100	
Third Professional Part – I			
Forensic Medicine & Toxicology - 1 paper	100	100	Mandatory 50% marks in theory and practical (practical = practical/ clinical + viva) [theory=theory paper(s) only]
Ophthalmology – 1 paper	100	100	
Otorhinolaryngology – 1 paper	100	100	
Community Medicine - 2 papers	200	100	
Third Professional Part – II			Internal assessment marks are not to be added to marks of the University examinations and should be shown separately in the grade card.
General Medicine - 2 papers	200	200	
General Surgery - 2 papers	200	200	
Pediatrics – 1 paper	100	100	
Obstetrics & Gynaecology - 2 papers	200	200	

As per proposed GMER 2019, the University examinations will be held in the month of September for first & second phase and October for final phase part 1. The examination for final phase part 2 will be held in the month of January (table 3).

Table 3: Examinations schedule

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							Foundation Course	I MBBS			
I MBBS								Exam I MBBS	II MBBS		
II MBBS								Exam II MBBS	III MBBS		
III MBBS Part I								Exam III MBBS Part I	Electives & Skills		
III MBBS Part II											
Exam III MBBS Part II		Internship									
Internship											

c. Theory question paper (Knowledge part) - For Universities and colleges

Universities should instruct paper setters to follow guidelines for paper setting as given below:

1. Follow MCI competencies for paper setting in your subject.
2. Designing of question paper should take into consideration all levels of knowledge domain e.g. Bloom’s taxonomy of cognitive domain. Use appropriate verbs for the questions at each level to assess higher levels of learning.¹⁷ An example is given below in table 4. Use combination of various types of questions e.g. structured essays (Long Answer Questions - LAQ), Short Answers Questions (SAQ) and objective type questions (e.g. Multiple Choice Questions - MCQ). Marks for each part should be indicated separately. MCQs if used, should not have more than 20% weightage. Example of theory paper and some examples of questions are given in annexure 2.

3. The question paper setter must sample the contents appropriately from competencies. The blueprinting grid can help the paper setters to balance the question papers in content related aspects as depicted below in table 5. Blueprinting will add to the value and quality of these assessments. Moderation of theory question paper by subject expert must be arranged by Universities

Table 4: Verbs in various levels in Knowledge domain (Bloom's taxonomy) ¹⁷

Level	Topic A	Topic B	Topic C	Topic D	Total
Knowledge	1	2	1	1	5 (20%)
Comprehension	1	1	1	2	5(20%)
Application	2	1	1	1	5 (20%)
Analysis	1	1	2	2	6(24%)
Synthesis		1		1	2 (8%)
Evaluation	1		1		2 (8%)
Total	6 24%)	6 (24%)	6 (24%)	7 (28%)	25 (100%)

Table 5: Blueprinting in knowledge domain

(Representative example only. Actual figures may vary with the subject and Phase)

Level	Suggested Verbs
Knowledge	Define, describe, Draw, Find, Enumerate, Cite, Name, Identify, List, label, Match, Sequence, Write, State
Comprehension	Discuss, Conclude, Articulate, Associate, Estimate, Rearrange, Demonstrate understanding, Explain, Generalise, Identify, Illustrate, Interpret, Review, Summarise
Application	Apply, Choose, Compute, Modify, Solve, Prepare, Produce, Select, Show, Transfer, Use
Analysis	Analyse, Characterise, Classify, Compare, Contrast, Debate, Diagram, Differentiate, Distinguish, Relate, Categorise
Synthesis	Compose, Construct, Create, Verify, Determine, Design, Develop, Integrate, Organise, Plan, Produce, Propose, Rewrite
Evaluation	Appraise, Assess, Conclude, Critic, Decide, Evaluate, Judge, Justify, Predict, Prioritise, Prove, Rank

Practical/Clinical examination

This part should include assessment in psychomotor and affective domain. Assessment of clinical and procedural skills should be based on direct observation by the examiners. Avoid making this assessment mainly targeted to knowledge

domain only e.g. by asking a learner in a room away from actual patient, “how history was taken”. Instead, learner should be observed while he/she is taking history.

The competencies dealing mainly with skills and affective domains in each subject must be included. Many of the tools mentioned for formative assessment may still not be useable/feasible at the University examinations e.g. mini-CEX. However, multiple tools like case presentations, OSCE and/or OSPE should be employed.^{11,14,18-22} The value of conventional case presentation should be improved by having 1 or 2 longer (15 minutes or so) OSCE type stations, where examiners can observe and assess complete history taking (e.g. family history, present history etc.) and/or physical examination skill. This can be done either with check lists or using global ratings. Not only will this improve the validity of case presentations, but also provide an opportunity to assess attitudes and communication in context.

Similarly, multiple teachers should be involved in assessment. This will help in not only taking care of subjectivity but also provide much needed training in assessment to senior residents and assistant professors.

The use of multiple methods, by multiple examiners, in multiple settings to assess multiple competencies, blueprinting and longitudinal assessment help to improve the reliability and validity of assessment.^{6, 18, 23}

These concepts have been incorporated in the proposed GMER 2019 and are reproduced below.

Excerpts from proposed GMER 2019

University Examinations

11.2.1 University examinations are to be designed with a view to ascertain whether the candidate has acquired the necessary knowledge, minimal level of skills, ethical and professional values with clear concepts of the fundamentals which are necessary for him/her to function effectively and appropriately as a physician of first contact. Assessment shall be carried out on an objective basis to the extent possible.

11.2.2 Nature of questions will include different types such as structured essays (Long Answer Questions - LAQ), Short Answers Questions (SAQ) and objective type questions (e.g. Multiple Choice Questions - MCQ). Marks for each part should be indicated separately. MCQs shall be accorded a weightage of not more than 20% of the total theory marks. In subjects that have two papers, the learner must secure at least 40% marks in each of the papers with minimum 50% of marks in aggregate (both papers together) to pass.

11.2.3 Practical/clinical examinations will be conducted in the laboratories and /or hospital wards. The objective will be to assess proficiency and skills to conduct experiments, interpret data and form logical conclusion. Clinical cases kept in the examination must be common conditions that the learner may encounter as a physician of first contact in the community. Selection of rare syndromes and disorders as examination cases is to be discouraged. Emphasis should be on candidate's capability to elicit history, demonstrate physical signs, write a case record, analyze the case and develop a management plan.

11.2.4 Viva/oral examination should assess approach to patient management, emergencies, attitudinal, ethical and professional values. Candidate's skill in interpretation of common investigative data, X-rays, identification of specimens, ECG, etc. is to be also assessed.

11.2.5 There shall be one main examination in an academic year and a supplementary to be held not later than 90 days after the declaration of the results of the main examination.

11.2.6 A learner shall not be entitled to graduate after 10 years of his/her joining of the first part of the MBBS course.

11.2.7 University Examinations shall be held as under:

(a) First Professional

1. The first Professional examination shall be held at the end of first Professional training (1+12 months), in the subjects of Human Anatomy, Physiology and Biochemistry.

2. A maximum number of four permissible attempts would be available to clear the first Professional University examination, whereby the first Professional course will have to be cleared within 4 years of admission to the said course. Partial attendance at any University examination shall be counted as an availed attempt.

(b) Second Professional

1. The second Professional examination shall be held at the end of second professional training (11 months), in the subjects of Pathology, Microbiology, and Pharmacology.

(c) Third Professional

1. Third Professional Part I shall be held at end of third Professional part 1 of training (12 months) in the subjects of Ophthalmology, Otorhinolaryngology, Community Medicine and Forensic Medicine and Toxicology

2. Third Professional Part II - (Final Professional) examination shall be at the end of training (14 months including 2 months of electives) in the subjects of General Medicine, General Surgery, Obstetrics & Gynaecology and Pediatrics. The discipline of Orthopaedics, Anaesthesiology, Dentistry and Radiodiagnosis will constitute 25% of the total theory marks incorporated as a separate section in paper II of General Surgery.

3. The discipline of Psychiatry and Dermatology, Venereology and Leprosy (DVL), Respiratory Medicine including Tuberculosis will constitute 25% of the total theory marks in General Medicine incorporated as a separate section in paper II of General Medicine.

9. Capacity building

Considering the importance of CBA in making competency based curriculum a success, preparing the faculty to decide and use appropriate tools is crucial. Faculty needs to move beyond 'conventional' assessment methods. It is also important to remember that usefulness of many newer tools depends on the way they are used. Faculty also needs to be trained to develop their own toolbox depending on resources, expertise and contextual factors.

The revised Basic Course Workshop (rBCW) in Medical Education Technologies provides training in tools to be used for lower two levels of Miller's pyramid while the Advance Course in Medical Education (ACME) trains in those for higher two levels. In addition, the trained faculty and Medical Education Units should have in-house programs to build capacity for assessment. Involving junior faculty in IA is a useful step to provide hands-on training in assessment. Sensitization and training of all stakeholders at the University and Institutional level is required.

It is equally important to involve the student community and make them aware of these changes. Many changes require a variance from established practices. Foundation course and introductory sessions in each department should orient the students to the changes in assessment.

10. Implementation & Monitoring / Curricular Governance

Internal assessment formats are to be developed by institutes and Universities as per proposed GMER 2019. The changes in summative assessment (University examination) are to be adopted by Universities and details to be provided to the affiliated colleges. Quality assurance techniques in formative assessment (self/peer monitoring) and University examinations (question paper moderation by subject experts, external monitoring or posting external observers/examiners) should be employed to improve assessment.

11. Examples / Models

The suggested formats are provided in annexure.

12. Bibliography and Further reading:

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Annexure 1

Suggested phase wise scheduling of tests for internal assessment for Colleges

(This is only a suggested sample plan. Local changes can be made if they conform to proposed GMER 2019)

Phase	Minimum Number of tests during the year	Remarks
1 st	Human Anatomy 3, Physiology 3, Biochemistry 3, Community Medicine 1	<ul style="list-style-type: none"> •ECE assessment should be included subject-wise •There should be at least one short question from AETCOM in each subject •One of the 3 tests in preclinical subjects should be prelim or pre-university examination
2 nd	Pathology 3, Pharmacology 3, Microbiology 3, Two tests for- General Medicine (Including Psychiatry, Dermatology, Venereology & Leprosy (DVL) and Respiratory Medicine including Tuberculosis), General Surgery (Including Orthopaedics, Dentistry, Anaesthesiology and Radiodiagnosis), Obstetrics& Gynaecology, Forensic Medicine & Toxicology and Community Medicine End of posting (EOP) examination at each clinical posting including those of allied subjects	<ul style="list-style-type: none"> •Clinical subjects should also be assessed at end of each posting (EOP) – Theory and Practical •There should be at least one short question from AETCOM in each subject •One of the 3 tests in Para-clinical subjects should be prelim or pre-university examination

3 rd	<p>Forensic Medicine & Toxicology 2, Community Medicine 2 Ophthalmology 2, Otorhinolaryngology 2,</p> <p>Two tests for- General Medicine (Including Psychiatry, Dermatology, Venereology & Leprosy (DVL) and Respiratory Medicine including Tuberculosis), General Surgery (Including Orthopaedics, Anaesthesiology and Radiodiagnosis), Pediatrics, Obstetrics &Gynaecology</p> <p>EOP examination at each clinical posting including allied subjects</p>	<ul style="list-style-type: none"> •Clinical subjects should also be tested at end of each posting (EOP)-Theory and Practical •There should be at least one short question from AETCOM in each subject •One of the tests in Ophthalmology, Otorhinolaryngology /Forensic Medicine &Toxicology/ Community Medicine should be prelim or pre-university examination
4 th	<p>Two Tests for- General Medicine (Including Psychiatry, Dermatology, Venereology & Leprosy (DVL) and Respiratory Medicine including Tuberculosis),General Surgery (Including Orthopaedics, Anaesthesiology and Radiodiagnosis), Pediatrics, Obstetrics & Gynaecology</p> <p>EOP examination at each clinical posting including that in allied subjects</p>	<ul style="list-style-type: none"> •Clinical subjects should also be tested at end of each posting (EOP) -Theory and Practical •There should be at least one short question from AETCOM in each subject •One of the tests in Medicine, Surgery, Pediatrics and Obstetrics & Gynaecology should be prelim or pre-university examination •Assessment of electives to be included in IA

AETCOM: Attitude, Ethics and Communication

Twenty five percent of weightage in theory tests in Medicine and Surgery should be given to allied subjects and there should be at least one question from each allied subject.

Annexure 2

Examples of theory questions

Sl. No.	Type	Explanation	Examples
1	Long essay question	<p>The question should pose a clinical/practical problem to the students and require them to apply knowledge and integrate it with disciplines. Avoid giving one liners as questions. The question stem should be structured and marking distribution should be provided. Use action verbs from higher domains as given in this document.</p> <p>Please avoid simple recall based questions. What is asked in the examination generally sets the agenda of what and how the students learn.</p>	<p>- A 6 days old term neonate has presented with jaundice noted at 3 days of age. He is born out of normal delivery at home. On examination, he looks pale, has a liver of 5 cms and spleen of 2 cms. Other systemic examination is normal.</p> <ol style="list-style-type: none"> a. What is your provisional diagnosis? b. Which other conditions need to be considered? c. Enumerate the lab tests that you will order and their likely reports in each of the diagnosis that you considered. d. Explain the physical findings in the light of underlying derangements. <p>- Describe the clinical features, complications and management of type 2 diabetes mellitus. (3+3+4=10)</p>

Sl. No.	Type	Explanation	Examples
2	Short notes	These provide opportunity to sample a wider content, albeit in a short time. The questions should be task oriented rather than 'Write a short note on xxx'. (Two questions based on ECE in Phase 1 in internal assessment) (Two questions based on integration in Phase 2 &3 in internal assessment)	<ol style="list-style-type: none"> 1. What are the various ways in which acute glomerulonephritis can present during childhood? 2. What is the role of antibiotics in childhood diarrhoeas? 3. What is the utility of routine vitamin K administration during new born period? 4. Compare and contrast the use of ramipril and amlodipine in treatment of hypertension.
3	Reasoning Questions	These provide excellent opportunities for testing integration, clinical reasoning and analytic ability of the student.	<ol style="list-style-type: none"> 1. Which components of breast milk help in prevention of neonatal infections? How do they help in prevention of infection? 2. Plan immunization for a 2 years old totally un-immunized child. 3. What is the physiological basis of origin of respiratory sounds? How can they help us in making a diagnosis? 4. Explain why adrenaline is the preferred medication in anaphylactic shock.

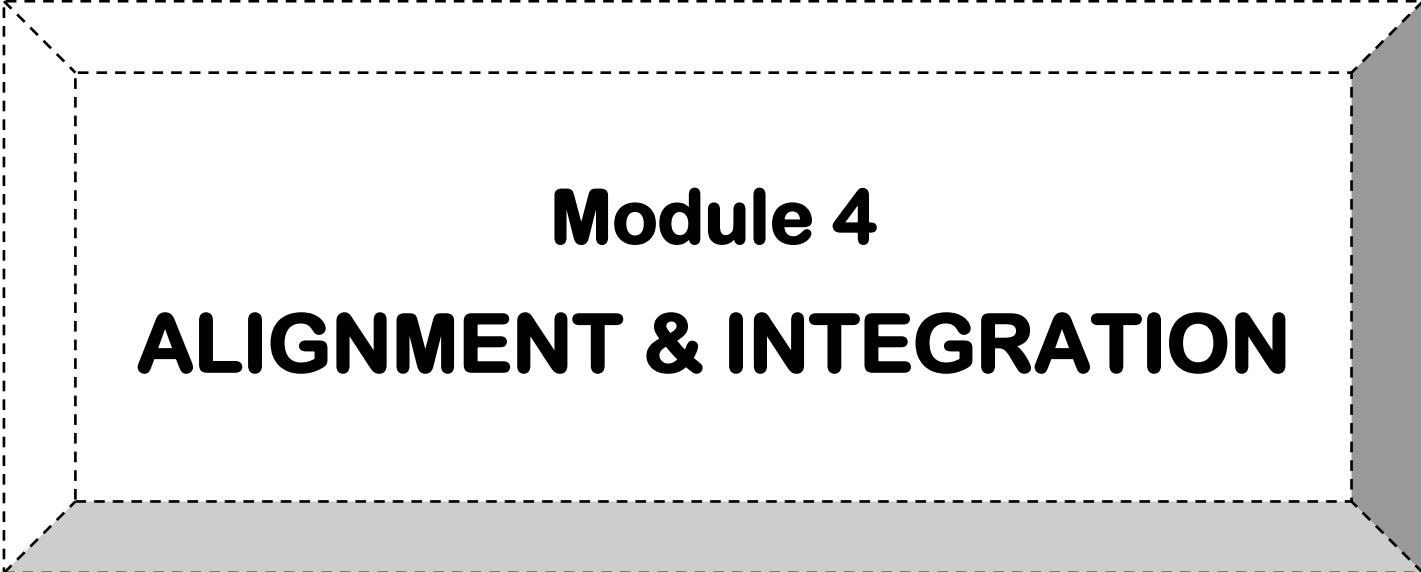
Sl. No.	Type	Explanation	Examples
4	Short notes Applied aspects	(Pre & Para-Clinical subjects: questions on applied aspect) (Clinical subjects: questions on preclinical basis)	<u>Pre & Para-Clinical subjects:</u> Describe clinical significance of half-life of drugs. <u>Clinical subjects:</u> Explain patho-physiological basis of clinical features of heart failure
5	Short notes AETCOM	(one question on AETCOM in all subjects in all phases)	Pharmacovigilance program of India AETCOM: What are the rights of a patient in a hospital setting
6	MCQs	MCQs should be scenario based, single response with 4 options in answers. Avoid one liner and negative terms in stem of question. Avoid 'all of above' and 'none of above' in options.	<p>1. A 25 year old lady was using oral contraceptives successfully for last two years. She got tuberculosis and was prescribed Rifampicin. She became pregnant after 2 months of starting Rifampicin despite continuing the oral contraceptives. Which of the following effects of Rifampicin can be the reason for this?</p> <p>A. Induction of oral contraceptive metabolism B. Stimulation of ovulation C. Interruption of entero-hepatic circulation D. Increased excretion of oral contraceptives</p> <p style="text-align: right;">Key: A</p>

Sl. No.	Type	Explanation	Examples
	MCQs		<p>2. A 2 year old child presents with excessive weight gain over last 1 week. He has puffy eyes, pitting edema and normal blood pressure. Urine examination shows no RBCs but massive proteinuria. Which of the following biochemical parameters is likely to be elevated in this child?</p> <p>a. Urea b. Cholesterol c. Creatinine d. Uric acid</p> <p style="text-align: right;">Key B</p> <p>3. Which of the following term best describes the decreased effects of beta adrenergic agonists in bronchial asthma after long term use?</p> <p>A. Pharmacokinetic tolerance B. Pharmacodynamic tolerance C. Tachyphylaxis D. Drug dependence</p> <p style="text-align: right;">Key: B</p>

Note: AETCOM question should be based on competencies (primarily knowledge based) acquired during teaching of the AETCOM module. At least one question in each paper of the clinical specialties should test knowledge - competencies acquired during the

professional development programme (AETCOM module); Skills competencies acquired during the Professional Development programme (AETCOM module) must be tested during clinical, practical and viva.

In subjects that have two papers, the learner must secure at least 40% marks in each of the papers with minimum 50% of marks in aggregate (both papers together) to pass in the said subject.



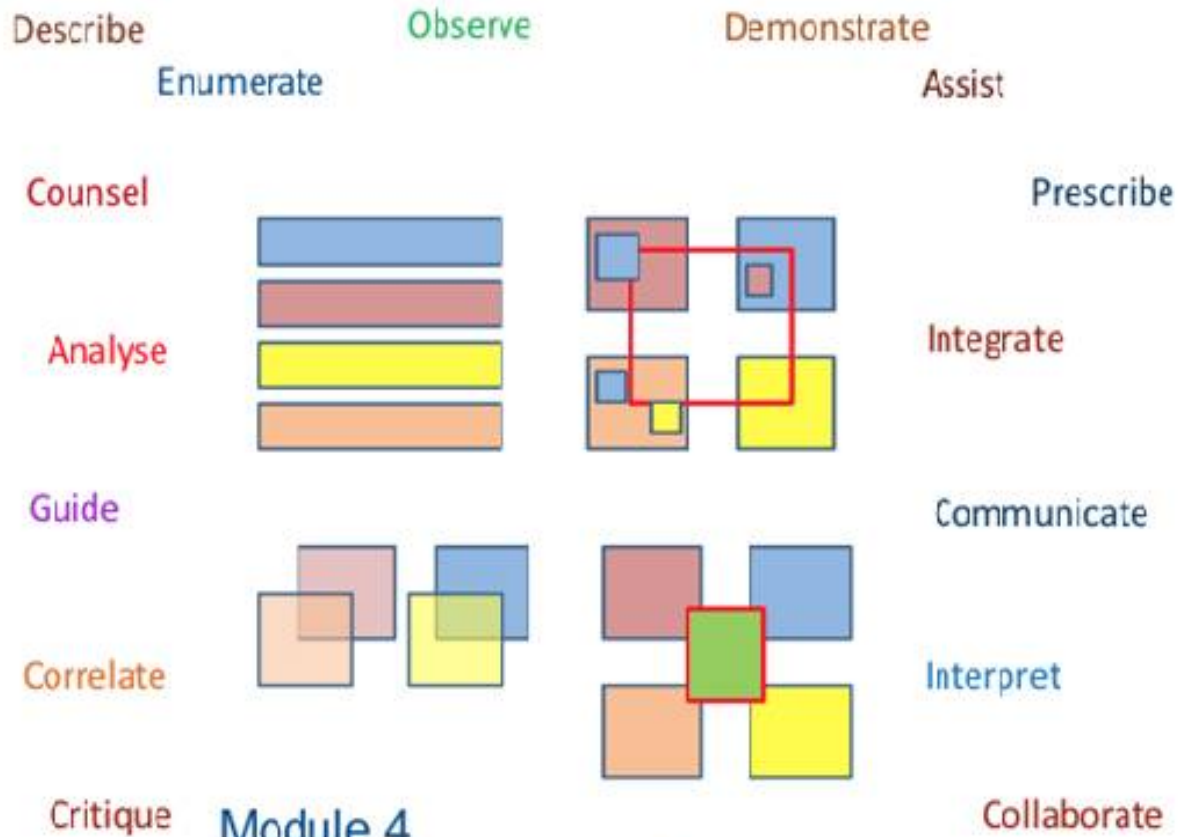
Module 4
ALIGNMENT & INTEGRATION



MEDICAL COUNCIL OF INDIA

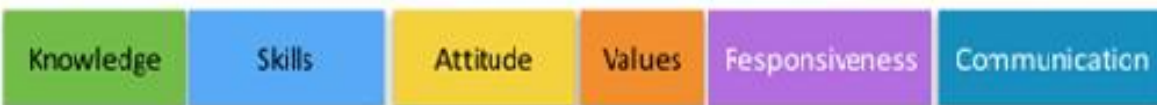
COMPETENCY BASED UNDERGRADUATE CURRICULUM
FOR
THE INDIAN MEDICAL GRADUATE

Knows Knows how Shows Shows how Performs



Alignment and Integration

Clinician Communicator Team Leader Professional Lifelong Learner



Curriculum Implementation Support Program

Alignment and Integration
Module for
Undergraduate Medical Education
Program
2019



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भारतीय आयुर्विज्ञान परिषद् के अधिक्रमण में शासी बोर्ड
BOARD OF GOVERNORS
IN SUPERSESSION OF MEDICAL COUNCIL OF INDIA

Foreword

Alignment and Integration

Subject based education has tremendous advantages. It provides learners with the opportunity to dwell deep into the learning matter and acquire strong fundamental concepts and the ability to build on it and attain scholarship. However, the unique needs of medical education necessitate both an understanding of “interconnectedness” between subjects and their ultimate application to the patient. In an attempt to address the need for enhancing the “wholesomeness” of education in the competency based curriculum while retaining the inherent strength and flavour of subject-based instruction, the Expert Group has recommended the use of two strategies: (a) alignment of related subject matter in a temporally coordinated fashion, and (b) use of three integration concepts that will enhance prior recall, application and emphasis of interconnectedness namely **sharing, nesting and correlation**.

This is a novel and challenging approach that has been suggested to further the goal of the competency driven curriculum that will require considerable planning, collaboration and team work amongst learners, teachers, planners and administrators in institutions. We believe that this investment is necessary to prepare learners to confront, adapt and be successful in the challenging environment of medical care. In addition to meeting the needs outlined, this approach will foster self - directed learning, team work, collaboration and inquiry. Importantly, the patient centricity that this approach will bring into the curriculum from year one will ensure that learners always have a connect with the ultimate goal of the MBBS program.

This booklet is intended to help institutions and teachers to design curriculum incorporating the approach suggested by the Expert Group. It is richly illustrated with examples on how to create an aligned and integrated timetable. We hope that this will be a useful guide.

We are grateful to the members of the Expert Group and the Academic Cell for painstakingly putting this booklet together. We hope that teachers and institutions will benefit from the suggestions provided herein and can successfully adapt and apply them into their own environment. We aspire to learn more and share with the nation the best practices that abound in all the medical colleges across the country. The ultimate aim of this exercise is to create a generation of doctors who will provide standard health care to the nation while becoming excellent scientists and scholars.

Chairman, Board of Governors

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Foreword

Alignment and Integration

This booklet provides a suggested pattern for alignment and integration of related competencies encapsulated in different subjects for teaching competency based MBBS program which commenced on August 1, 2019 across the country. Alignment of related topics to the extent feasible is a major thrust of the competency based curriculum. The Regulations in Graduate Medical Education 2019 (GMER 2019) also suggests integration to the extent of 20% of the subject-based curriculum through horizontal and vertical integration. This booklet is in alignment with the GMER 2019 part II document and provides institutions and curriculum planners a step by step approach to create a timetable for teaching, incorporating the principles of alignment and integration.

This booklet has been developed by experts invited by the Board of Governors in supersession of the Medical Council of India and incorporates their vast expertise and experience. The Council acknowledges their time and effort dedicated in creating this guide that can be used by institutions to develop their own learning process and content. Appreciation is also due to the efforts of the Academic Cell of the Council and faculty at the various Regional and Nodal Centres of MCI who worked tirelessly to ensure that the new competency driven curriculum and its various unique components are implemented faithfully and flawlessly across the medical colleges in this country from August 2019.


(Dr. R.K. Vats)
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Curriculum Implementation Support Program

Module – 4

ALIGNMENT AND INTEGRATION

Alignment and Integration

Introduction

The purpose of the MBBS program is to facilitate the medical student to become a primary caregiver to patients. Learning in the various basic and clinical science subjects is predominantly directed towards achieving this purpose. The volume and details required by the student to master each subject that comprises the overall MBBS program is considerable. Subject based instruction provides an opportunity for the student to acquire both vast and deep knowledge of each subject. This structure of instruction, however, may lead to lack of appreciation by the student of the interconnected nature of knowledge in the various subjects, their relatedness, and importantly their relevance to patient care. Additionally study in silos alone may lead to redundancy in instruction.

Several innovative methods have been developed over the years to address these challenges including various levels of integration of instruction that diminishes and removes boundaries within subjects both horizontally in a phase and vertically across phases. While appreciating the value of these approaches, the proposed Graduate Medical Education Regulations (GMER) 2019 has sought to strike a balance that will retain the strength of traditional subject-based teaching and the reality of subject based assessment while providing the relevance, opportunity to understand the interconnectedness and reduce redundancy in the subjects being taught.

In order to achieve this, the MBBS curriculum will become a) aligned to the extent possible - meaning that as much as possible topics in different subjects in the same phase that have similar threads will be grouped together in the timetable and b) integrated to a limited extent both vertically and horizontally. The purpose of horizontal integration (within a phase) is to remove redundancy and provide interconnectedness. In the earlier phases, the purpose of vertical integration (across phases) is to emphasise the applicative use of the basic science concept taught. In the later phases, its purpose is to utilise and build on prior knowledge and emphasise the foundations of clinical practice.

This document is meant to guide institutions, Curriculum Committee, MEU members, and teachers on how to create a timetable that incorporates the principles that have been laid down above reflecting the spirit of the proposed GMER document 2019.

Objective

The participant must be able to:

Facilitate the development of an aligned and integrated curriculum in his/her institution as envisaged in the GMER 2019 document.

Glossary of terms used

For the purposes of this document -

Alignment implies the teaching of subject material that occurs under a particular organ system/disease concept from the same phase in the same time frame i.e., temporally.

Integration implies that concepts in a topic/ organ system that are similar, overlapping or redundant are merged into a single teaching session in which subject based demarcations are removed. For the purpose of this document, topics from other phases that are brought into a particular phase for the purpose of reinforcement or introduction will also be considered as integrated topics. In the GMER 2019, time for integrated teaching is clearly demarcated.

Linker is a session that allows the learner to link the concepts presented in an aligned and integrated topic.

Curricular element or Program addressed

Alignment and Integration

Relevant Extracts from GMER 2019

10.1 Preamble: The salient feature of the revision of the medical curriculum in 2019 is the emphasis on learning which is competency-based, integrated and student-centered acquisition of skills and ethical & humanistic values.

Each of the competencies described below must be read in conjunction with the goals of the medical education as listed in items 2 and 3 of the GMER.

It is recommended that didactic teaching be restricted to less than one third of the total time allotted for that discipline. Greater emphasis is to be laid on hands-on training, symposia, seminars, small group discussions, problem-oriented and problem-based discussions and self-directed learning. Students must be encouraged to take active part in and shared responsibility for their learning.

10.2 Integration must be horizontal (i.e. across disciplines in a given phase of the course) and vertical (across different phases of the course). As far as possible, it is desirable that teaching/learning occurs in each phase through study of organ systems or disease blocks in order to align the learning process. Clinical cases must be used to integrate and link learning across disciplines.

Subject specific competencies with appropriate alignment and integration are available in the new competency based UG Curriculum document uploaded in the Medical Council of India website.

Description of the curricular program

Alignment

Teaching related systems or topics from different subjects in the same phase is strongly recommended. This is the principal method to be followed while creating the phase-wise timetable or calendar and is called alignment (see figure 1).

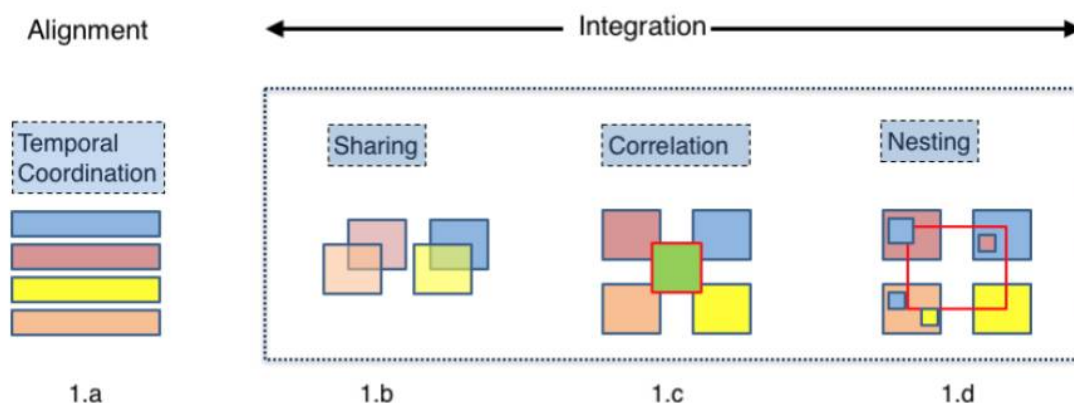


Figure 1: Integration concepts framed in the GMER 2019. Coloured boxes represent subjects. **1a. Alignment - Temporal coordination:** The timetable is adjusted so that topics within the subjects or disciplines which are related, are scheduled at the same time. **1b. Sharing:** Two disciplines may agree to plan and jointly implement a teaching program. **1c. Correlation:** The emphasis remains on disciplines or subjects with subject-based courses taking up most of the curriculum time. Within this framework, an integrated teaching session or course is introduced in addition to the subject-based teaching (green box with red border). **1d. Nesting:** the teacher targets, within a subject-based course, skills relating to other subjects (*Adapted from Harden R Med Edu 2000. 34; 551*).

Alignment is recommended for the majority of the curriculum allowing similar systems or topics in different subjects to be learnt separately but during the same time frame.

Aligning could be done as organ system based (figure 2a) or topic/disease based (figure 2b) or both (figure 2c)

Example: Syllabi in Cardiovascular system or Respiratory system in anatomy, physiology and biochemistry can be scheduled simultaneously in the timetable (figure 2a).

Example: A topic such as acute myocardial infarction or Tuberculosis can be created with the relevant learnings that will lead to the understanding of these topics

If desired, the major alignment can be organ system based with incorporation of some specific topics that will lend itself to integration (see below).

For eg. – In CV organ system the major alignment is with two topics, Acute Myocardial Infarction and Heart failure.

These topics or organ systems that are going to be aligned should be identified by the Curriculum Committee of the teaching institution and must be taught in an aligned fashion in each phase.

The method to derive topic objectives and sessions from competencies is outlined further in this booklet.

Mon	Tues	Wed	Thurs	Fri	Sat
Intro	An	An	An	Bi	Ass
Ph	Ph	An	An/Rad	An	Ass
Bi	Ph	P	Ph	An	SDL
An	An	Ph/Bi	Ph	Ph	
Ph	Ph/Bi	An	Ph	An	
CM	Ph	Bi	AETCOM	An	

Mon	Tues	Wed	Thurs	Fri	Sat
An	An	An	An	Bi	Ass
Ph	Intro	Ph	Intro	An/Rad	Ass
Bi	Ph	An	Ph/Med	Ph	SDL
An	An	Sh Ph/Bi	Ph/Mic	Ass	
Ph	Ph/Bi	Ph/Bi	Ph/Phar	Ph	
CM	Ph	Bi	AETCOM	An	

	CV system
	Respiratory System
	Unaligned sessions
	Shared sessions
	Nested sessions
An	Anatomy
Ph	Physiology
Bi	Biochemistry
Rad	Radiology
Intro	Introduction
Ass	Assessment

Representative timetable using showing how alignment can be done using an organ system based timetable

Figure 2a: Creating an aligned timetable using organ systems (six hours per day basis)

Mon	Tues	Wed	Thurs	Fri	Sat
An	An	An	An	Bi	Ass
Ph	Intro	An	An/Rad	An	Ass
Bi	Ph	PhBi	Ph/Med	An	SDL
An	An	Ph/Bi	Ph	Ph	
Ph	ECE	An	Ass	An	
CM	Ph	Bi	AETCOM	An	

Mon	Tues	Wed	Thurs	Fri	Sat
An	An	Intro	An	Bi	Ass
Ph	Intro	Ph	Intro	An/Rad	Ass
Bi	Ph	An	Ph/Med	Ph	SDL
An	An	Bi	Ph/Mic	Ass	
Ph	ECE	Ph	Ph/Phar	Ph	
CM	Bi	Bi	AETCOM	An	

	AITO MI
	AITO Tuberculosis
	Unaligned sessions
	Shared sessions
	Nested sessions
An	Anatomy
Ph	Physiology
Bi	Biochemistry
Rad	Radiology
Intro	Introduction
Ass	Assessment

Representative timetable using showing how alignment can be done using a Aligned and Integrated Topic Based timetable

Figure 2b: Creating an aligned timetable using Topics

Mon	Tues	Wed	Thurs	Fri	Sat
Intro	An	An	An	Bi	Ass
Ph	Ph	Intro	An/Rad	An	Ass
Bi	Ph	PhBi	Ph/Med	An	SDL
An	An	Ph/Bi	Ph	Ph	
Ph	Ph/Bi	An	Ass	An	
CM	Ph	Bi	AETCOM	An	

Mon	Tues	Wed	Thurs	Fri	Sat
An	An	An	An	Bi	Ass
Ph	Intro	Ph	Intro	An/Rad	Ass
Bi	Ph	An	Ph/Med	Ph	SDL
An	An	Sh Ph/Bi	Ph/Mic	Ass	
Ph	Ph/Bi	Ph/Bi	Ph/Phar	Ph	
CM	Ph	Bi	AETCOM	An	

	CV system
	AITO MI
	Respiratory System
	AITO Tuberculosis
	Unaligned sessions
	Shared sessions
	Nested sessions
An	Anatomy
Ph	Physiology
Bi	Biochemistry
Rad	Radiology
Intro	Introduction
Ass	Assessment

Representative timetable using showing how alignment can be done using system based timetable with use of topics in each system to improve integration

Figure 2c: Creating an aligned timetable using organ systems and topics

Integration

Integration is a learning experience that allows the learner to perceive relationships from blocks of knowledge and develop a unified view of its basis and its application. The GMER 2019 applies these principles to the extent that will retain the strengths of subject based education and assessment while providing experiences that will allow learners to integrate concepts.

Keeping this in mind, the Regulations recommend the adoption of temporal coordination (called **alignment** in this document) as the major method to be followed allowing similar topics in different subjects to be learnt separately but during the same time frame (Fig 1a).

Example: Pancreatic Beta cell anatomy and histology, Pancreatic Beta cell physiology and Insulin structure and synthesis in biochemistry are usually taught at different times of the year. An effort is made to group these related topics in different subjects during the same time frame in the calendar (figure 3a and 3b).

In a small proportion - not to exceed 20% of the total curriculum an attempt can be made to **share** (figure 1b) topics or **correlate** (figure 1c) topics by using an integration or linker session. The integration session most preferred will be a case-based discussion in an appropriate format ensuring that elements in the same phase (horizontal) and from other phases are addressed.

Example: Since there is significant overlap in liver function in physiology and bilirubin metabolism in biochemistry - two departments could **share** sessions thereby reducing redundancy in what is being taught. (Note that it is not essential for two teachers to teach but it is important that the session is planned to ensure that the objectives of both subjects are achieved) (figure 3c).

As much as possible, the necessary correlates from other phases must also be introduced while discussing a topic in a given subject - **Nesting** (figure 1d).

Example: In a session on bilirubin metabolism a patient (a paper case is sufficient) with Dubin Johnson syndrome is **nested** as a short discussion to provide an understanding of what can go wrong, how does it manifest and what is the relevance and future application of learning bilirubin metabolism (figure 3e).

Care must be taken to ensure that achievement of phase based objectives are given primacy - the integrative elements from other phases are used only to provide adequate recall and understand the clinical application of concepts. It must be emphasised that integration does not necessarily require multiple teachers in each class. Experts from each phase and subject may be involved in the lesson planning but not in its delivery unless deemed necessary.

Topics that cannot be aligned and integrated must be provided adequate time in the curriculum throughout the year. These concepts are summarised in table 1 and figure 3 (a-e).

Assessment will continue to be subject based. However, efforts must be made to ensure that phase appropriate correlates are tested to determine if the learner has internalised and integrated the concept and its application.

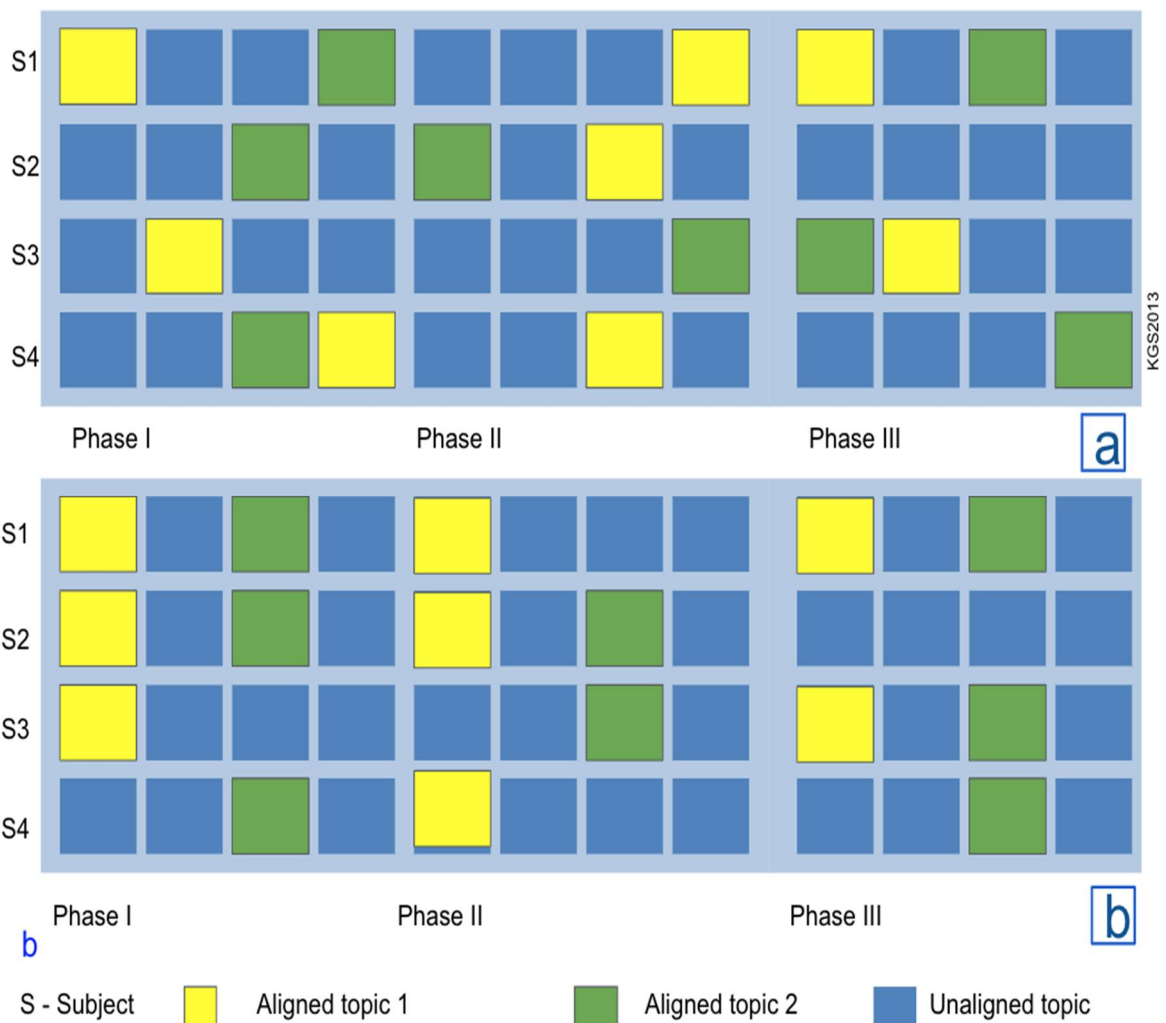
Table 1. Considerations for using alignment and integration in the curriculum

Competency /Objective	Same Phase	Different Phase
Cannot be aligned with a similar topic in a different subject eg. Lower limb anatomy and dissection	Teach separately	-
Can be taught together in different sessions in the same topic eg. Beta Cell histology in anatomy, Beta Cell function in physiology and structure and secretion of insulin, in biochemistry	Align	-
Can be taught in the same session in the same topic eg. Sharing - function of the hepatocyte, in physiology and bilirubin metabolism, in biochemistry eg. Nesting - Present the clinical features and laboratory data of patient with Dubin Johnson syndrome in a session on Bilirubin metabolism	Share	Nest
Can be used to link concepts taught in a particular topic eg. a patient with Type 1 Diabetes is used to understand the functions of the pancreatic islet - secretion and metabolism	-	Correlate

Figure 3: Pictorial illustration of alignment and integration concepts used in the GMER

Figure 3a: Traditionally topics which have the same core of ideas in different subjects are taught at different times.

Figure 3b: Alignment is teaching these related components of a topic from different subjects at the same time i.e, in a temporally coordinated fashion.



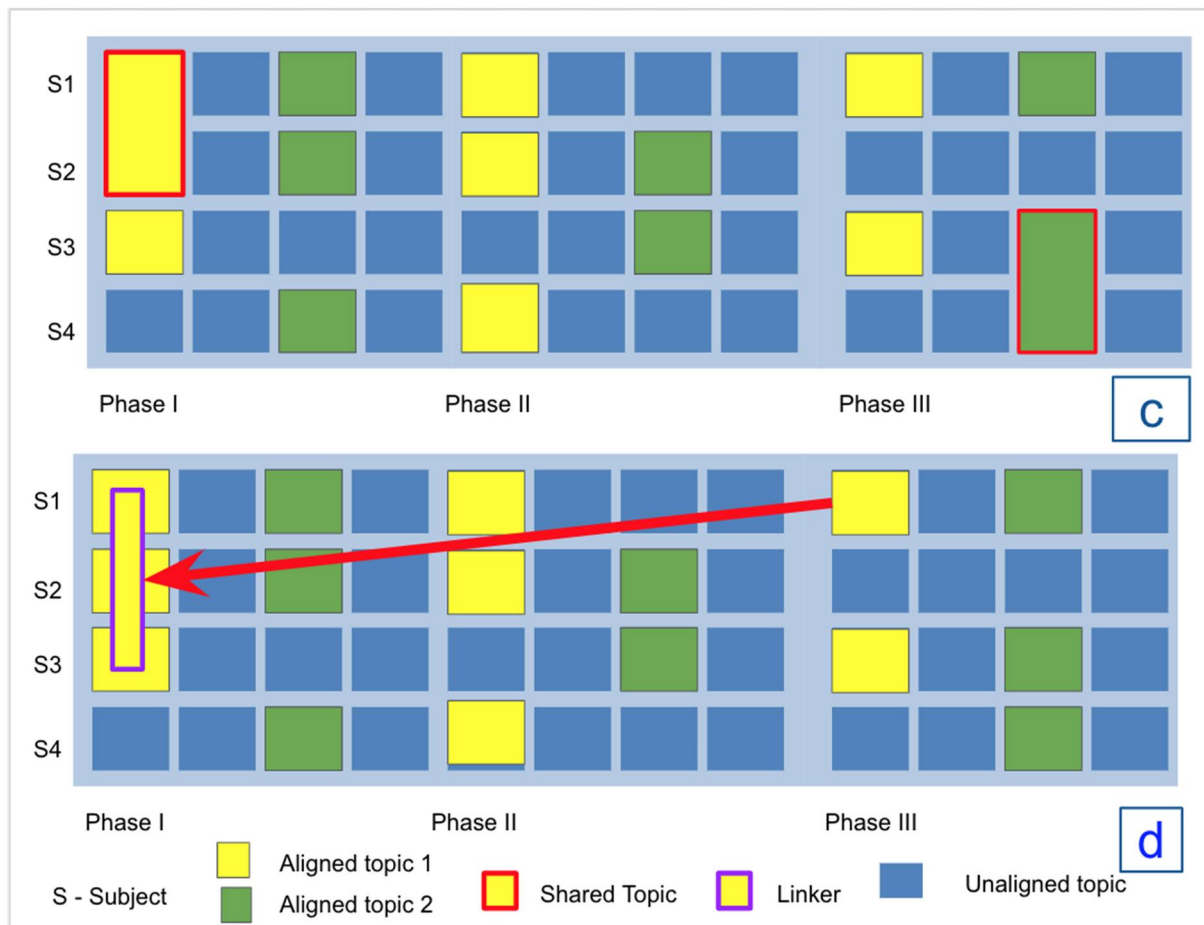


Figure 3c: Redundancy can be reduced by creating a session, merging session objectives from two or more subjects and creating a shared session (Box with red outline).

Figure 3d: Increased correlation can be achieved by using a Linker (Box with purple outline) - usually a case (with sufficient complexity) from the same topic from a higher phase is used to anchor the learning.

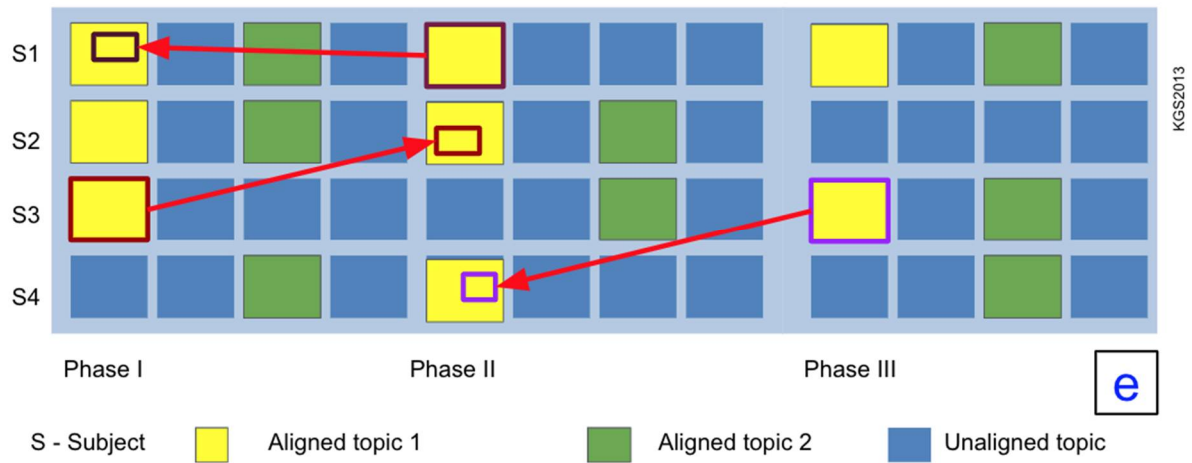


Figure 3e: Appropriate concepts from other phases can be brought into a phase: to increase relevance at a lower phase or increase prior recall or reinforce the fundamental basis at a higher phase. This is done by nesting some learning objectives from the topic in other phases into a learning session.

Steps in the development of Aligned and Integrated Topic (AITo) (Figure 4)

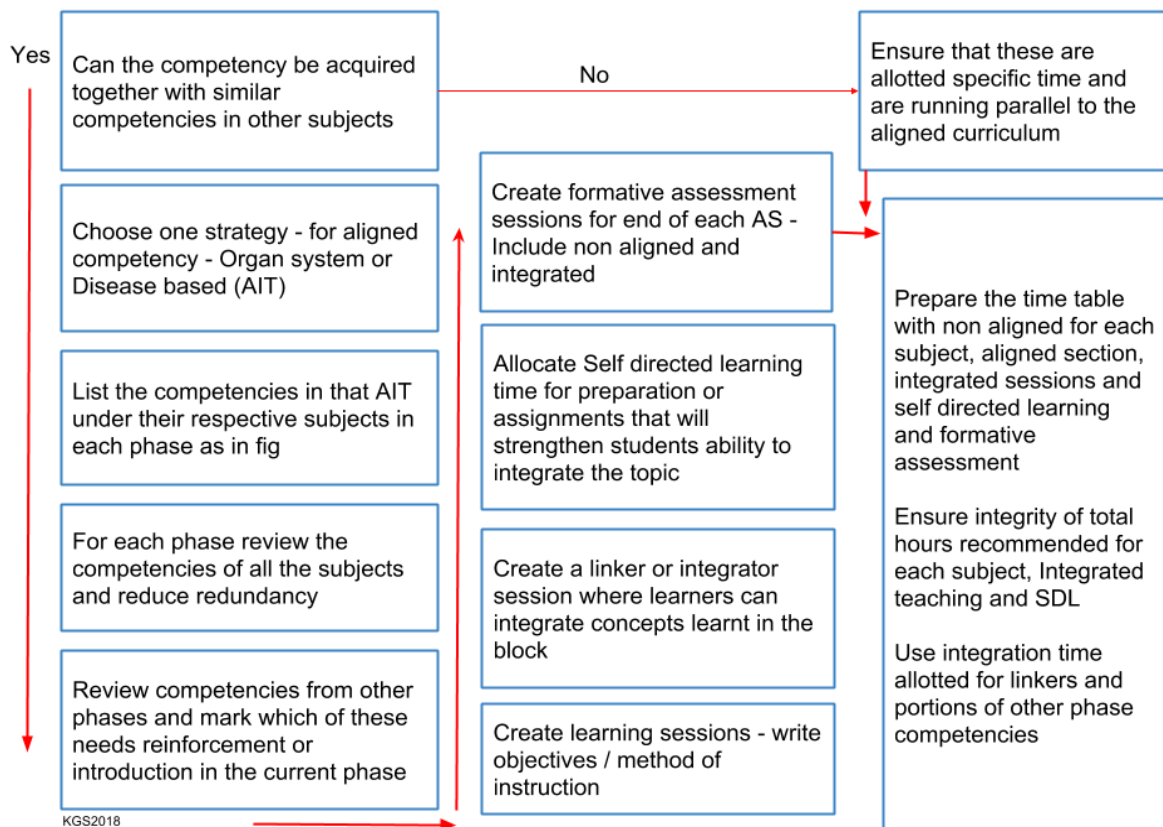


Figure 4: Overview of process to create an aligned and integrated topic

Step 1: Identify a list of topics or organ systems that will be accommodated in the timetable as aligned and integrated topics (AITo). Examples of such topics included: Anemia, Febrile illnesses, Trauma etc. are provided in Appendix 1 **of this book**. Examples of organ system are Cardiovascular System, Gastro-intestinal system, Endocrine system.

Step 2: From the subject-wise competency document book developed by the MCI, transfer the competences that address the topic into a template. Arrange these competencies according to phase and subject (see Appendix 3 for an example).

Examples for the topics are available in Appendix 1. A glossary to understand competency is available in Appendix 2. A comprehensive list of competency for the AITo Anemia is available in Appendix 3.

Step 3: For each competency, derive learning objectives, learning sessions and assessment methods.

- a. A learning session is created by putting together a bunch of objectives that can be accomplished in the allotted time and/or require a similar method of instruction.
- b. A bunch of learning sessions that are put together that address the topic from different subjects in the phase form an Aligned and Integrated Topic (AITo).

(See Figures 5-8 extracted from the Competency based UG curriculum document published by the Medical Council of India that illustrates this process).

Step 4: In each AITo of the phase, it is important to review competencies from the previous phase that will bear reinforcement in the current phase. Similarly, it is important to ensure that competencies in the next higher phases are reviewed to explore if some of these require introduction in this phase. Integration sessions allotted in each phase may be used to deliver these competencies.

- a. By reviewing objectives / competencies in a phase, redundant ones and those in each subject that can be taught together without a subject demarcation can be identified for horizontal integration (**Sharing**).
- b. Similarly, by reviewing objectives or competencies across phases, those with a common thread can be identified for vertical integration (**Nesting and Correlation**).
- c. Objective writing and session planning must be done with teachers of all subjects involved in the aligned and integrated topic (AITo) and their inputs taken for the integrated session.
- d. It is important to remember that ***the concept and not necessarily teachers*** have to be integrated. Using different teachers in each integrated session is nice but rarely required.

Step 5: Consider adding a **linker** to each AITo. A linker, as defined above, is a session that aptly links the various related stand-alone elements represented in an AITo and helps **Correlate**. In the medical curriculum, the linker is most commonly a case. A case that is creatively written can be used in each phase (often the same case) to allow students to correlate what they have learnt and apply into understanding disease process, diagnosis and care. Using a case-based discussion in small groups will, in addition, encourage collaborative and self-directed learning. Using the case discussion at different time points in AITo, will allow students to reinforce and link concepts appropriately.

An example of creating learning sessions with objectives incorporating principles of alignment, sharing, nesting and correlation is illustrated in figure 9 (1-8).

Step 6: Ensure that adequate time for the AITo is created in the time table. It is important to consider the inclusion of an end of block assessment that will count towards formative/internal assessment.

Important: While creating the timetable ensure that topics in each subject that cannot be aligned are also taught simultaneously in each subject and that the timetable accommodates these topics appropriately.

An example of timetable incorporating an aligned and integrated topic is available in Appendix 4. The functions of the AIT team in collaboration with phase-wise Curriculum subcommittee and Curriculum Committee in creating the AIT is illustrated in figure 11 in the section on governance.

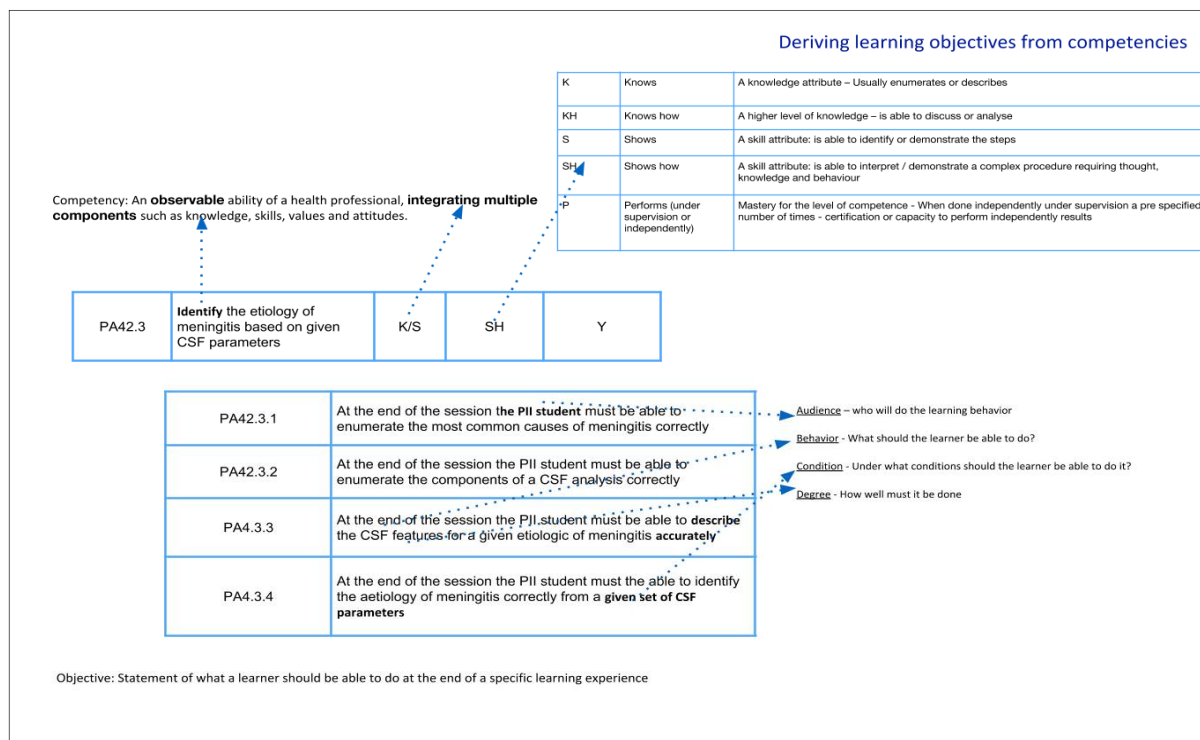


Figure 5 - Deriving learning objectives from competencies

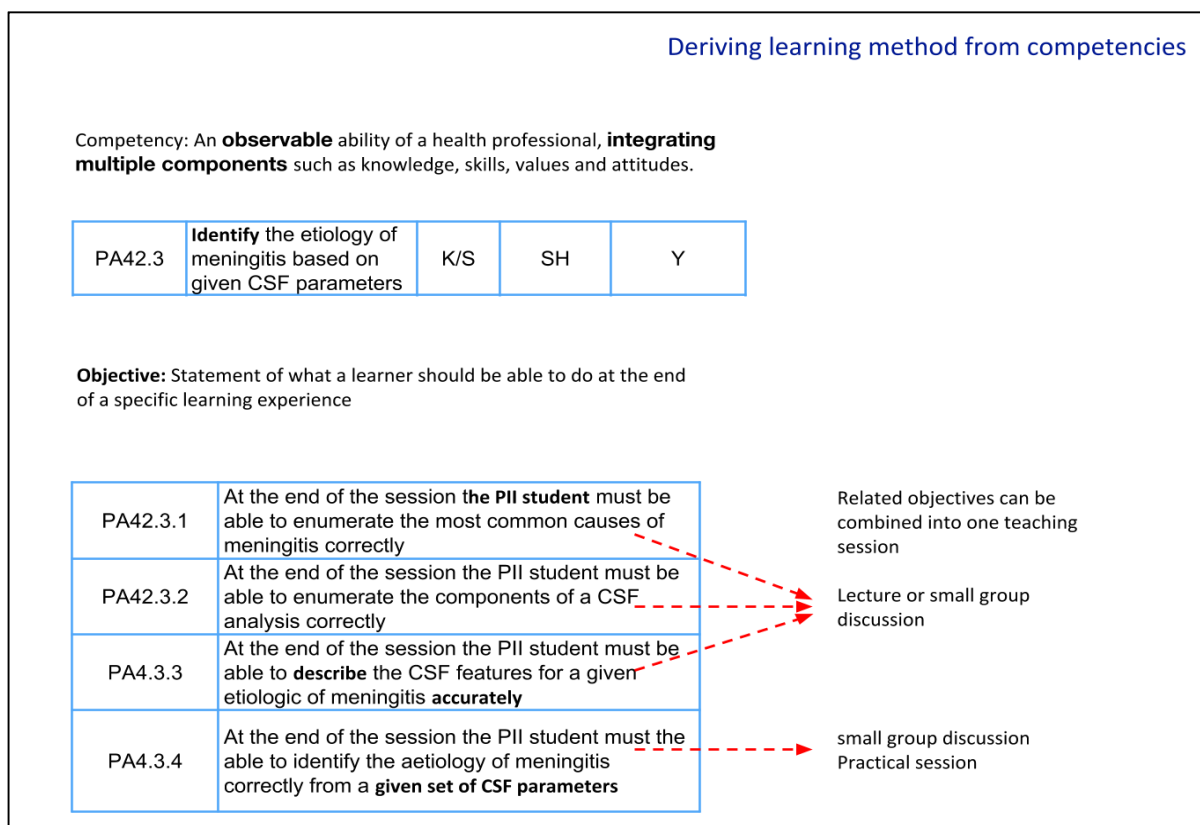


Figure 6. Deriving learning methods from competencies

Deriving assessment method from competencies

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

PA42.3	Identify the etiology of meningitis based on given CSF parameters	K/S	SH	Y
--------	---	-----	----	---

Objective: Statement of what a learner should be able to do at the end of a specific learning experience

PA42.3.1	At the end of the session the PII student must be able to enumerate the most common causes of meningitis correctly	Short note or part of structured essay: Enumerate 5 causes of meningitis based on their prevalence in India
PA42.3.2	At the end of the session the PII student must be able to enumerate the components of a CSF analysis correctly	Short note or part of structured essay: Enumerate the components tested in a CSF analysis
PA4.3.3	At the end of the session the PII student must be able to describe the CSF features for a given etiologic of meningitis accurately	Short note or part of structured essay: Describe the CSF findings that are characteristic of tuberculous meningitis
PA4.3.4	At the end of the session the PII student must be able to identify the aetiology of meningitis correctly from a given set of CSF parameters	Short note / part of the structured essay/ Skill station/ Viva: Review the CSF findings in the following patient and identify (write or vocalise) the most likely ethology

Figure 7: Deriving assessment methods from competencies

Deriving integration from competencies

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

MI2.4	List the common microbial agents causing anemia. Describe the morphology, mode of infection and discuss the pathogenesis, clinical course, diagnosis and prevention and treatment of the common microbial agents causing Anemia.	K	KH	Y	Didactic Small group	Written Viva	Medicine	Pathology
-------	--	---	----	---	-------------------------	-----------------	----------	-----------

Objective: Statement of what a learner should be able to do at the end of a specific learning experience

MI2.4.1	Enumerate the common microbial agents causing anaemia	<p>Integrate concept - not necessarily teachers Plan session with teachers of both subjects -Teachers from both subjects usually not needed to Ensure redundancy and duplication removed by reviewing both subjects</p> <p>Horizontally aligned and integrated with pathology</p> <p>Vertically integrated with general medicine</p> <p>Integrate concept - not necessarily teachers Plan session with teachers from both phases Make a decision on how much of the information needs to be brought to this phase to make it relevant Consider how a competency can ascend over phases For eg - can be at a KH - know how in phase II but become a SH in phase III For vertical integration with clinical subjects use of a case to link the concept (a well written paper case is sufficient. Using teachers from both phases is rarely required</p>
MI2.4.2	Describe the morphology of agent (1,2 etc)	
MI2.4.3	Describe the mode of infection of agent in humans	
MI2.4.4	Discuss the pathogenesis of anemia caused by agent	
MI2.4.4	Describe the clinical course of infection by agent	
MI2.4.5	Enumerate the diagnostic tests to identify the aetiology of agent as a cause of anaemia	
MI2.4.6	Discuss the methods to prevent infection by agent	
MI2.4.7	Describe the treatment of infection by agent	

Figure 8: Marking objectives/ competencies for integration

Figure 9 (1-8) has used anemia as an example for creating an Aligned and Integrated topic.

Note: A comprehensive list of competencies for the topic anemia gleaned from the competency booklet is presented in Appendix 3.

For illustrative purposes only

AITO - Anemia	Step 1. Identify relevant competencies in each subject in the phase that can be taught in a temporally coordinated fashion under a topic	
Phase 1 Competencies	<p>Physiology Describe and discuss the synthesis and functions of Haemoglobin and explain its breakdown. Describe variants of haemoglobin KH</p>	<p>Biochemistry Describe the functions of haem in the body and describe the processes involved in its metabolism and derangements associated with these. KH Describe the major types of haemoglobin and its derivatives found in the body and their physiological/ pathological relevance. KH</p>

Figure 9.1 In this example two related competencies are identified from physiology (purple) and Biochemistry (Green) from the competency booklet

AITO - Anemia	Step 2. List session objectives for each subject that can be taught in a temporally coordinated fashion	
Phase 1 Competencies	<p>Physiology Describe and discuss the synthesis and functions of Haemoglobin and explain its breakdown. Describe variants of haemoglobin KH</p>	<p>Biochemistry Describe the functions of haem in the body and describe the processes involved in its metabolism and derangements associated with these. KH Describe the major types of haemoglobin and its derivatives found in the body and their physiological/ pathological relevance. KH</p>
Session Objectives	<p>At the end of the session the student must be able to</p> <ol style="list-style-type: none"> Enumerate the steps in the synthesis of hemoglobin Enumerate the steps in the breakdown of hemoglobin Describe the functions of hemoglobin Describe the process of oxygen carrying by hemoglobin Enumerate the major variants of hemoglobin Describe the structure function relationship of hemoglobin variants Describe the changes in function consequent to abnormalities in hemoglobin structure Describe the changes in function consequent to abnormalities in hemoglobin function 	<p>At the end of the session the student must be able to</p> <ol style="list-style-type: none"> Describe the functions of hemoglobin Describe the structure of hemoglobin Enumerate the major variants of hemoglobin Describe the alteration seen in the major variants of hemoglobin Describe the structure function relationship of variants of hemoglobin Describe the steps in the metabolism of hemoglobin Describe the changes in metabolism consequent to abnormalities or variance in hemoglobin structure / composition
		<p>Purple: Physiology Green: Biochemistry Brown: Pathology</p> <p>Principle : Alignment</p>

Fig 9.2 Session objectives are derived for each competency are identified

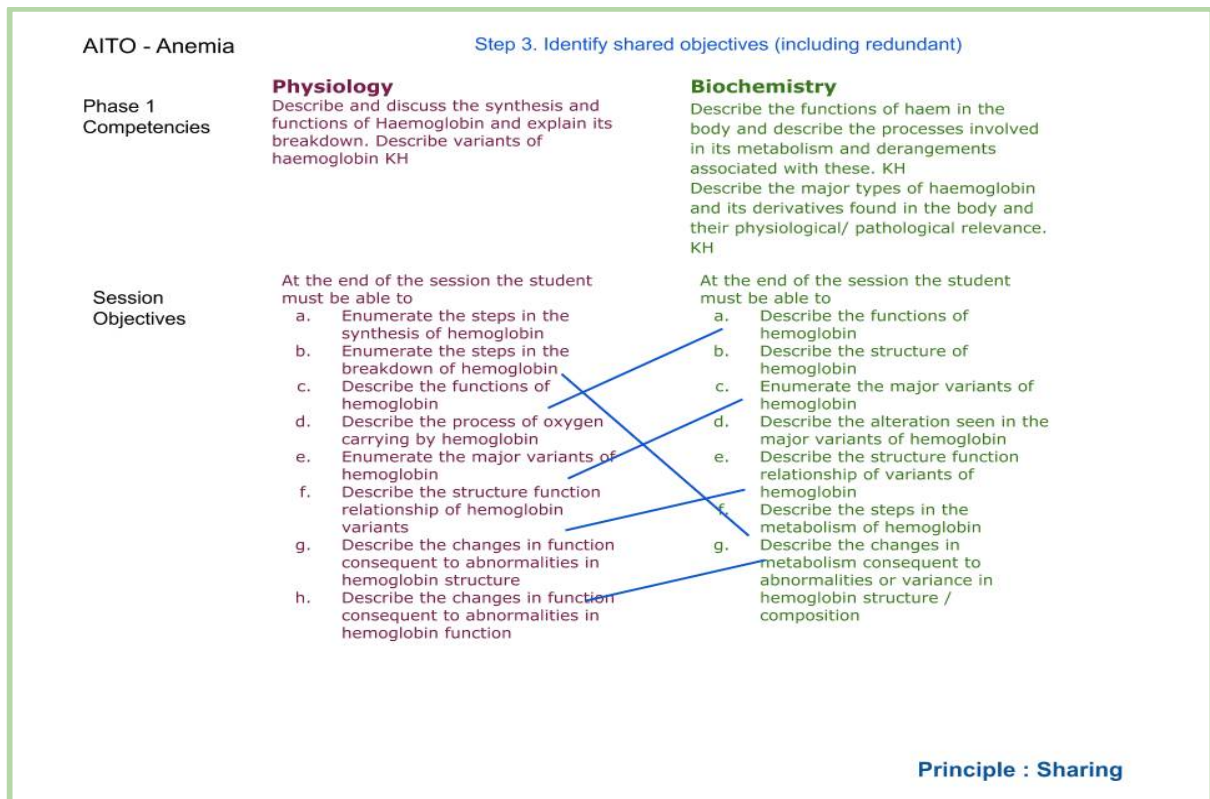


Fig 9.3 Objectives that are similar to both subjects are marked for redundancy and sharing

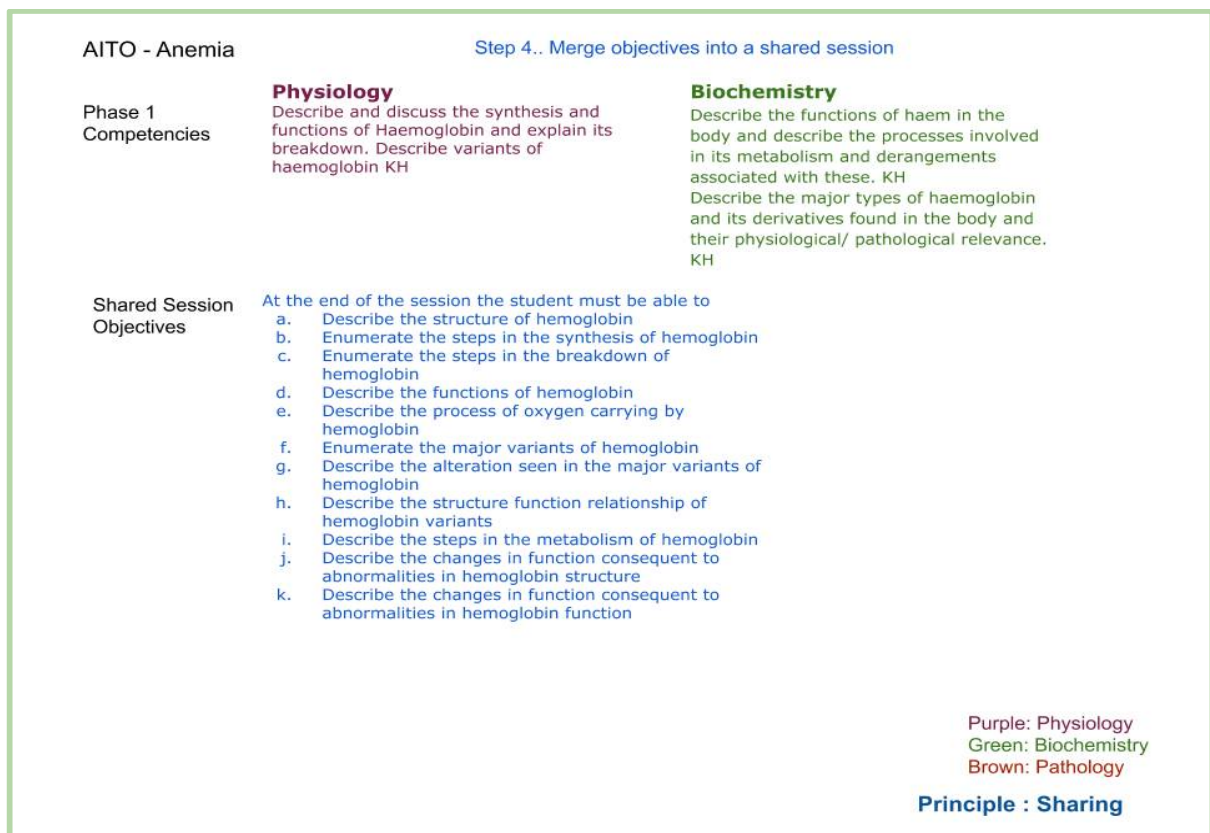


Fig 9.4 A new shared session is created merging the objectives from both subjects by removing redundancy

AITO - Anemia		Step 5. If needed identify competencies from other phases for vertical integration	
Phase 1 Competencies	Physiology Describe and discuss the synthesis and functions of Haemoglobin and explain its breakdown. Describe variants of haemoglobin KH	Biochemistry Describe the functions of haem in the body and describe the processes involved in its metabolism and derangements associated with these. KH Describe the major types of haemoglobin and its derivatives found in the body and their physiological/ pathological relevance. KH	
Shared Session Objectives	At the end of the session the student must be able to <ul style="list-style-type: none"> a. Describe the structure of hemoglobin b. Enumerate the steps in the synthesis of hemoglobin c. Enumerate the steps in the breakdown of hemoglobin d. Describe the functions of hemoglobin e. Describe the process of oxygen carrying by hemoglobin f. Enumerate the major variants of hemoglobin g. Describe the alteration seen in the major variants of hemoglobin h. Describe the structure function relationship of hemoglobin variants i. Describe the steps in the metabolism of hemoglobin j. Describe the changes in function consequent to abnormalities in hemoglobin structure k. Describe the changes in function consequent to abnormalities in hemoglobin function 		
Phase 2 Competencies	Pathology Define and classify hemolytic anemia Describe the pathogenesis and clinical features and hematologic indices of hemolytic anemia Describe the pathogenesis features, hematologic indices and peripheral blood picture of sickle cell anemia and thalassemia		Purple: Physiology Green: Biochemistry Brown: Pathology
			Principle : Nesting

Fig 9.5 If desired, subjects from other phases are reviewed for competencies that will enhance the value of the learning session - in this instance a few competencies from pathology are brought into phase I to enhance the value of learning in the shared session.

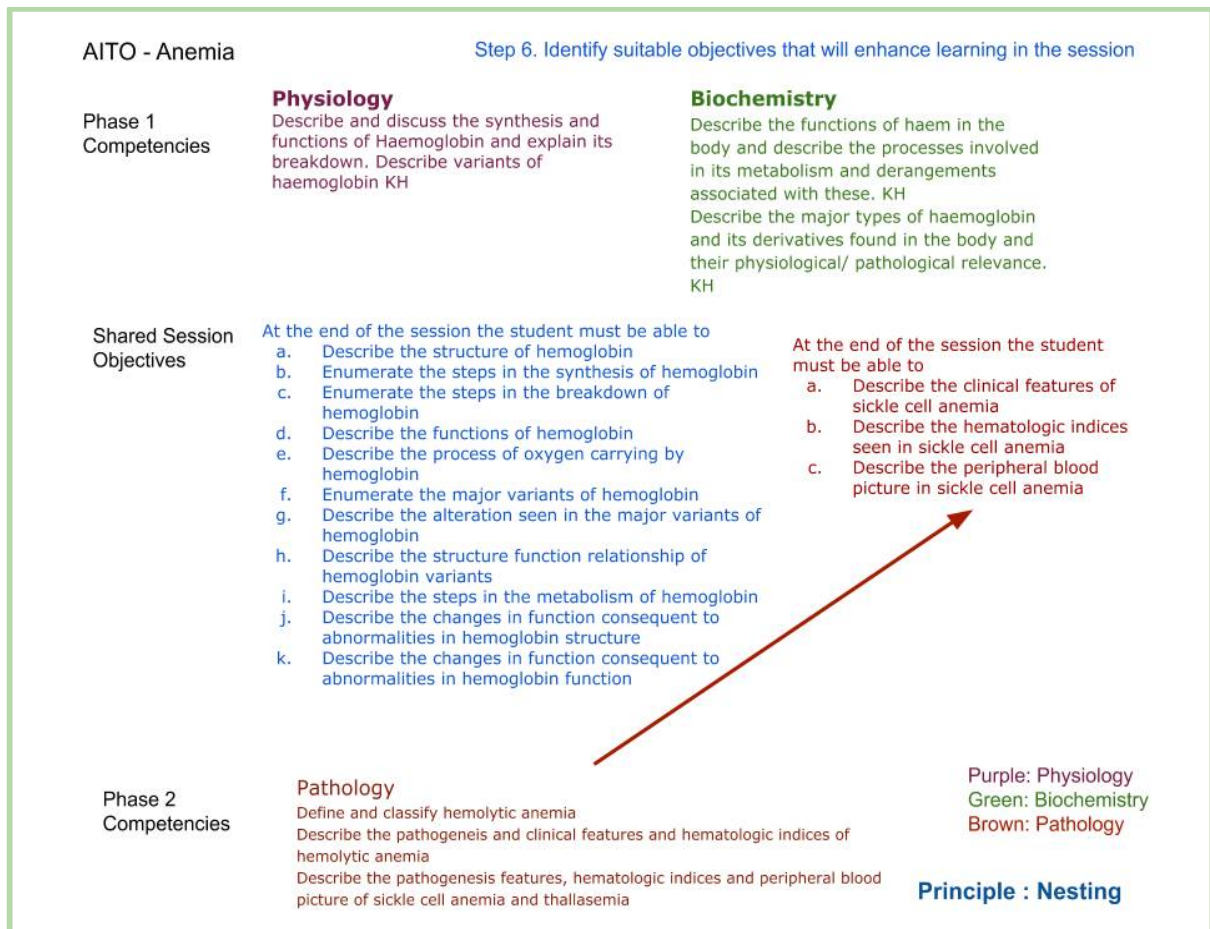


Fig 9.6 Objectives from the pathology (brown) competencies are listed

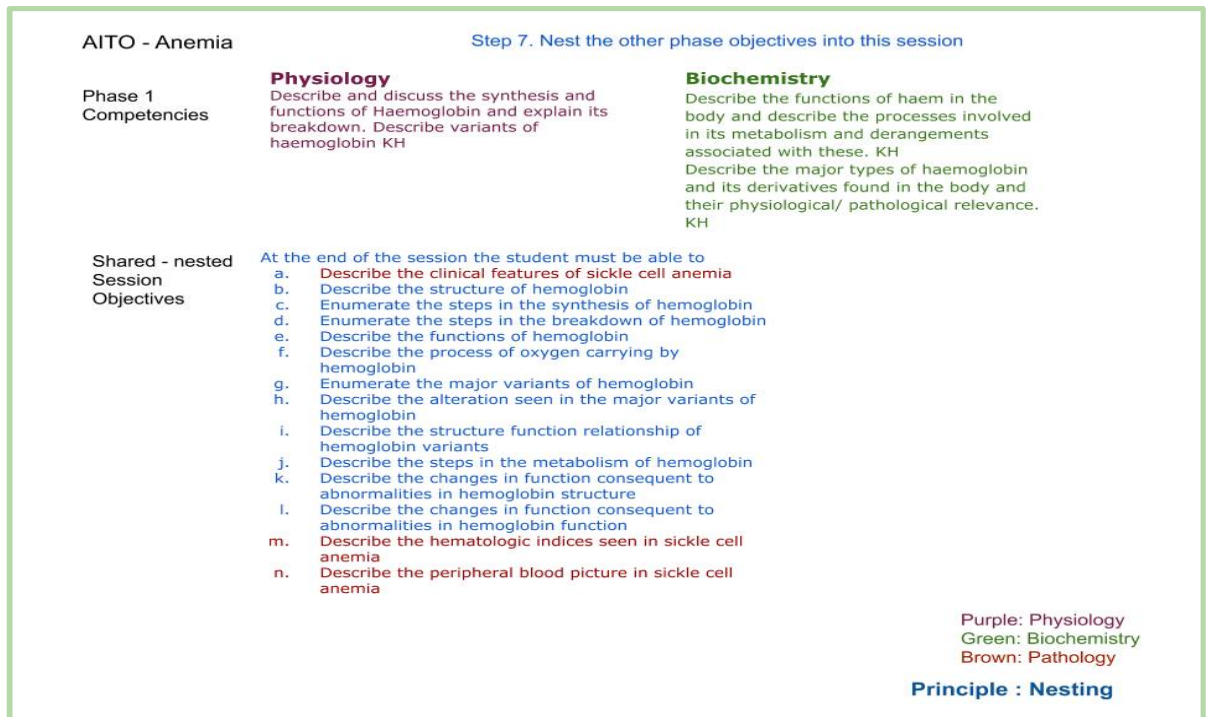


Fig 9.7: Selected objectives are “nested” to the shared session

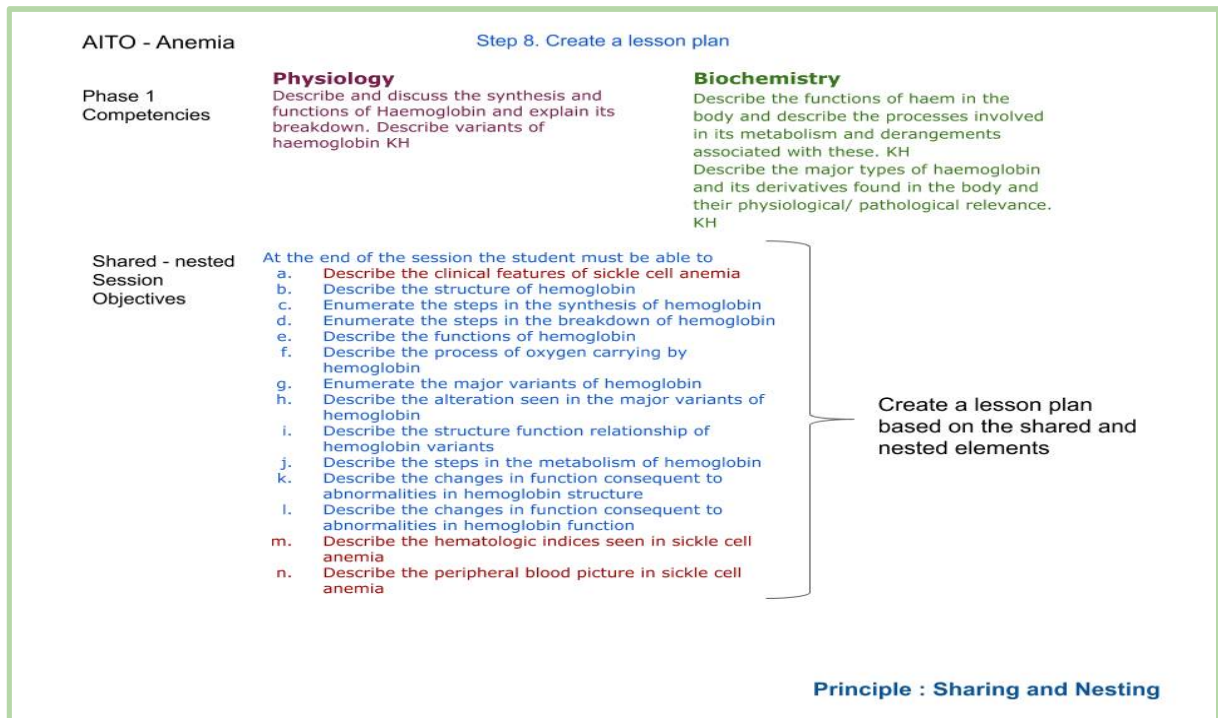


Fig 9.8 A lesson plan is created for the integrated session

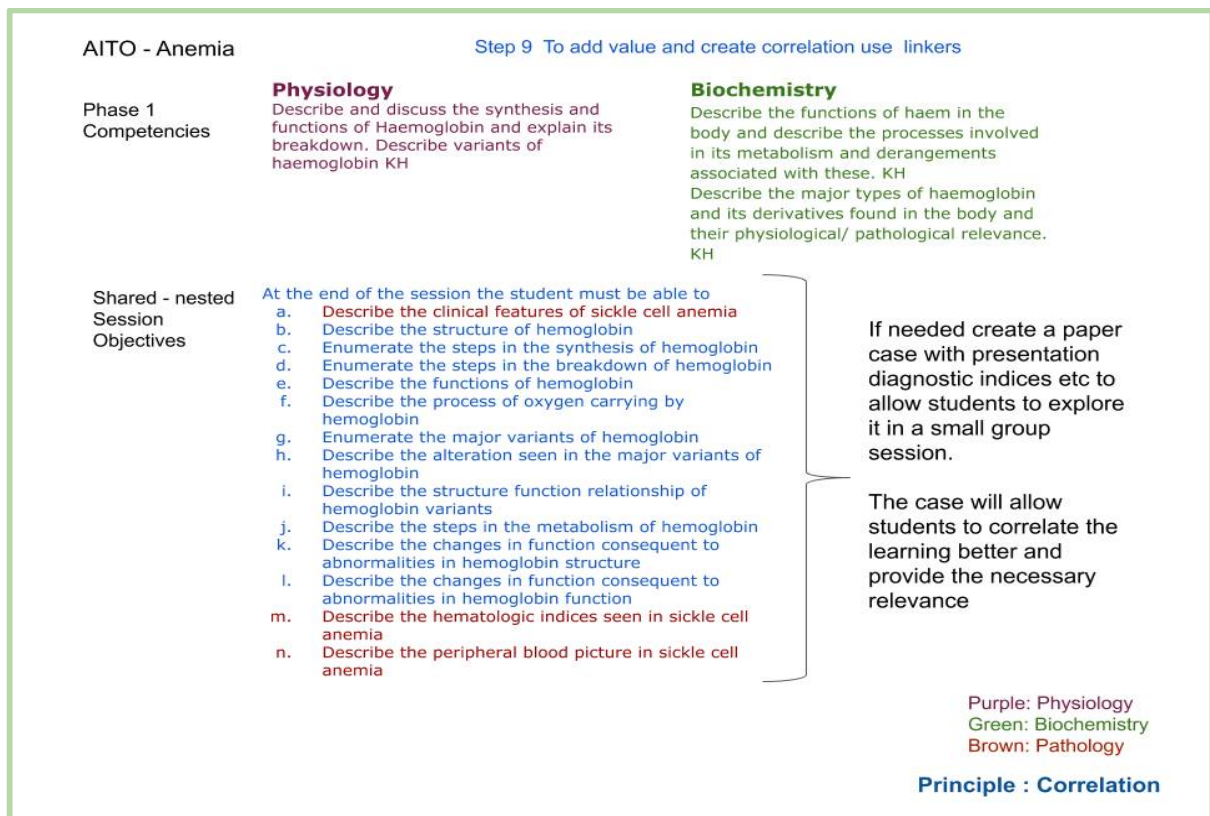
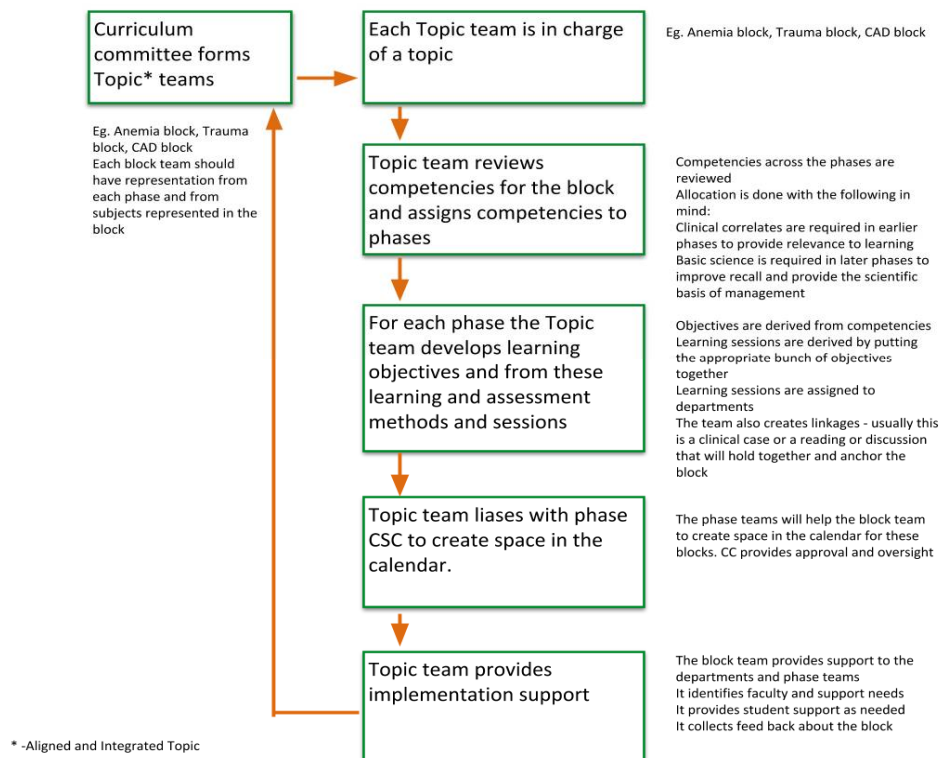


Fig 9.9 A paper case is often used as a linker to improve the relevance and allow greater correlation

Curricular Governance required to create and implement an Aligned and Integrated Curriculum

Creating an aligned and integrated topic



3

Figure 10: Steps and oversight required in development of Aligned and Integrated Topic

The development of an aligned and integrated curriculum will require significant collaboration from all stakeholders. In addition, curricular oversight will be required for its smooth implementation.

1. The Dean as the head of the institution and also as the Chairman of the Curriculum Committee will be responsible for the overall development, implementation and oversight of the curriculum.
2. The Curriculum Committee as constituted in accordance with the directives of the MCI will:
 - a. Develop a strategy for creating and implementing the curriculum and providing oversight,
 - b. Decide if the alignment will be topic or organ system based,
 - c. Create a phase-wise Curriculum Subcommittee (PWCS) to oversee the creation and delivery of aligned and integrated curriculum,
 - d. Create and support topic teams which will develop objectives and learning sessions for each topic across the phases,
 - e. Approve and release the annual timetable for each phase,

- f. Liaise with the Medical Education Unit or Department for required faculty support.
3. The Phase-wise Curricular Sub-committees (PWCSC) may be constituted with heads of Departments or key faculty in each phase with adequate representation from other phases and reporting to the Curriculum Committee. The PWCSC should:
 - a. Review competencies for each phase and convert them into learning objectives,
 - b. Align the curriculum as much as possible and enlist help from other phases in creating necessary vertical integration and links,
 - c. Reduce redundancy across the phase by integrating overlapping teaching elements,
 - d. Develop learning and assessment methods for each phase,
 - e. Prepare the timetable for the phase and present it to the Curriculum Committee for approval.
4. If needed, topic teams or Alignment and Integration (AIT) teams may be created. These teams will have at least one member from each department across phases and is responsible for delivery of the topics identified. The AIT team will:
 - a. Create learning and assessment sessions of the Aligned and Integrated Topics (AITo) identified across phases,
 - b. Represent the Aligned and Integrated Topic (AITo) to the phase-wise Curricular subcommittee and/or Curriculum Committee,
 - c. Review competencies and develop learning objectives for the topic,
 - d. Assign learning objectives to each phase and teaching session,
 - e. Develop learning and assessment methods for the AITo,
 - f. Help faculty with delivering session appropriately and in a collaborative manner across phases,
 - g. Collect feedback for the AITo, and
 - h. Provide student support.

Further reading

Required Reading

1. Ronald M Harden, The integration ladder: a tool for curriculum planning and evaluation, *Medical Education* 2000;34:551-557.
2. Alam Sher Malik & Rukhsana Hussain Malik, Universiti Teknologi MARA, Malaysia Twelve tips for developing an integrated curriculum". *Medical Teacher* 2011; 33: 99–104.
3. David G. Brauer & Kristi J. Ferguson 1, Washington University School of Medicine, USA, University of Iowa, USA; The integrated curriculum in medical education: AMEE Guide No. 96.
4. Integration of basic and clinical sciences - AMEE 2008 Paul Bradley and Karen Mattick, Peninsula College of Medicine and Dentistry, UK, <https://amee.org/getattachment/Conferences/AMEE-Past-Conferences/AMEE-Conference-2008/Introduction-to-Medical-Education-Bradley-Mattick.pdf>.

Additional reading

1. Gustavo A. Quintero, John Vergel, Martha Arredondo, Maria-Cristina Ariza, Paula Gomez & Ana-Maria Pinzon-Barrios, Integrated Medical Curriculum: Advantages and Disadvantages. *Journal of Medical Education and Curriculum Development* 2016; J Med Educ Curric Dev 3:S18920 (online).

Appendix 1

Examples of aligned and integrated topics (indicative)

Anemia
Jaundice
Diabetes
Thyroid Diseases
Nutrition
Febrile Illness
Tuberculosis
Malaria
Diarrhoea
Ischemic Heart Disease
Polycystic Ovarian Syndrome

Appendix 2

Understanding the competencies table

1	2	3	4	5	6	7	8	9	10
No.	Competencies	Domain	K/KH/SH/P	Core	Suggested Teaching Learning method	Suggested Assessment method	No req to certify P	Vertical Integration	Horizontal integration
Physiology									
Summary Name of Topic: General Physiology Number of competencies: (08)									
Number of procedures that require certification: Nil									
PY1.1	Describe the structure and functions of a mammalian cell	K	KH	Y	Lectures, Small group discussion	Written/viva			Biochemistry
GM25.4	Elicit document and present a medical history that helps delineate the aetiology of these diseases that includes the evolution and pattern of symptoms, risk factors, exposure through occupation and travel	S	SH	Y	bed side clinic, DOAP	Skill assessment	no of times a skill needs to be done independently to be certified for independent performance Rarely used in UG	Community Medicine	
<p>Unique number of the competency First two alphabets represent the subject (see list) Number following alphabet reflects topic Number following period is a running number</p> <p>Description of competency</p> <p>Identifies the domain or domains addressed K - Knowledge S - Skill A - Attitude C - Communication</p> <p>Identifies if the competency is core or desirable. Y indicates Core</p> <p>Identifies the level of competency required based on the miller's pyramid K - Knows KH- Knows How S - Skill SH - Show How P - Perform independently</p> <p>Identifies the suggested learning method. DOAP - Demonstrate (by student) Observe Assist Perform</p> <p>Identifies the suggested assessment method Skill assessment - Clinics, Skills lab, Practicals etc</p> <p>Subject(s) in other phases with which the competency can be vertically integrated to increase relevance or improve basic understanding</p> <p>Subject(s) in the same phase with which the competency can be horizontally integrated or aligned to allow a more wholesome understanding</p>									

Appendix 3

How to choose competencies from different subjects in various phases for a given topic

(illustrative example)

Competencies for the topic anemia from various phases from the competency booklet volumes 1-3

Year	No.	Competencies*	No.	Competencies*	
1		Physiology		Biochemistry	
	PY2 .1	Describe the composition and functions of blood components			
	PY2 .2	Discuss the origin, forms, variations and functions of plasma proteins	BI 5. 2	Describe and discuss functions of proteins and structure-function relationships in relevant areas eg, hemoglobin and selected hemoglobinopathies	
	PY2 .3	Describe and discuss the synthesis and functions of Haemoglobin and explain its breakdown. Describe variants of haemoglobin	BI 6. 11	Describe the functions of haem in the body and describe the processes involved in its metabolism and describe porphyrin metabolism.	
	PY2 .4	Describe RBC formation (erythropoiesis & its regulation) and its functions	BI 6. 12	Describe the major types of haemoglobin and its derivatives found in the body and their physiological/ pathological relevance.	
				No	
2		Pathology		Pharmacology	
	PA1 3.1	Describe hematopoiesis and extramedullary hematopoiesis	P H 1. 35	Describe drugs used in hematological disorders and discuss mechanism/s of action, types, doses, side effects, indications and contraindications, like 1. Drugs used in anemias 2. Colony Stimulating factors	
				Microbiology	
				M 1 2 4	List the common microbial agents causing anemia. Describe the morphology, mode of infection and discuss the pathogenesis, clinical course, diagnosis and prevention and treatment of the common microbial agents causing Anemia.

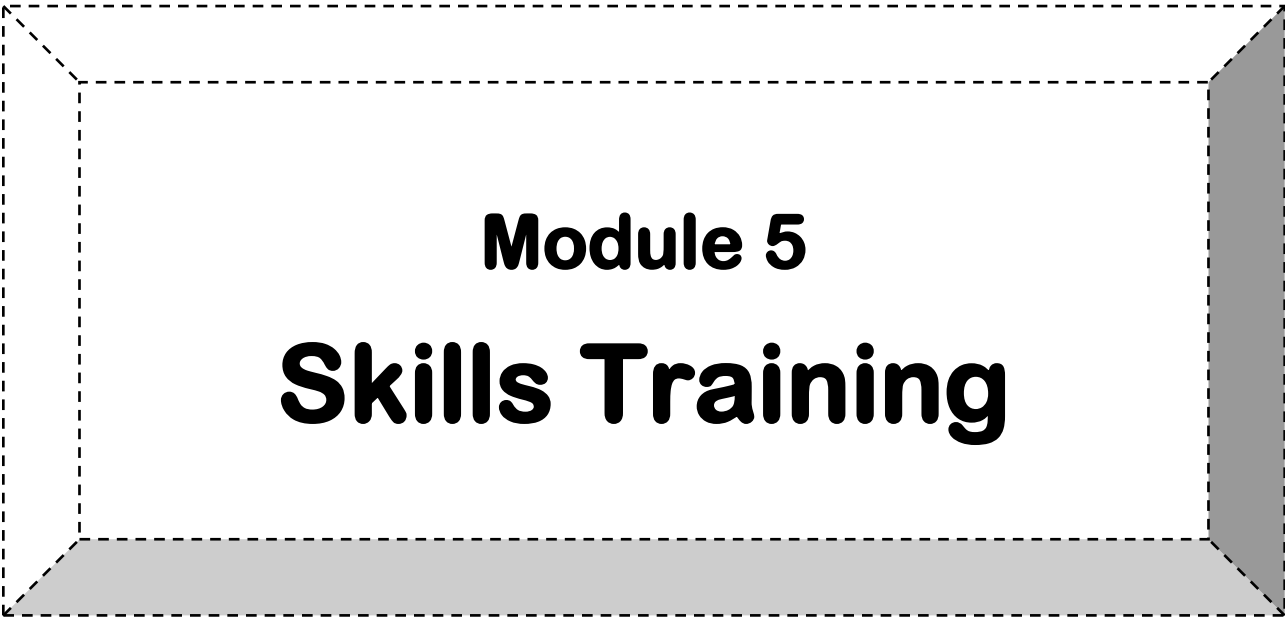
	PA1 3.2	Describe the role of anticoagulants in hematology		
	PA1 3.3	Define and classify anemia		
	PA1 3.4	Enumerate and describe the investigation of anemia		
3		Medicine		Pediatrics
	IM9. 1	define describe and classify anemia based on red blood cell size and reticulocyte count	PE 13 .1	Discuss the RDA, dietary sources of Iron and their role in health and disease
	IM9. 2	describe and discuss the morphological characteristics aetiology and prevalence of each of the causes of anemia	PE 13 .2	Describe the causes, diagnosis and management of Fe deficiency
	IM9. 4	describe and discuss the genetic basis of some forms of anemia	PE 13 .3	Identify the clinical features of dietary deficiency of Iron and make a diagnosis
	IM9. 5	elicit document and present a medical history that includes symptoms, risk factors including GI bleeding, prior history, medications, menstrual history, and family history	PE 13 .4	Interpret hemogram and Iron Panel

* List of competencies only representative, not complete.

Appendix 4

Sample time table with AIT

Time	Day1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	DAY 8
8-9 am	Blood and its components by a Hematologist Linker-Case 1 PY 2.1 Describe the composition and functions of blood and its components		Linker Part A of case 1 addresses PY 2.1 PY 2.2 PY 2.9 small group discussion + Formative assessment					Written Assessment PY 2.5 PA 13.3
9-10 am	Blood groups , Principles of Blood transfusion and banking PY 2.9 Describe different blood groups and discuss the clinical importance of blood grouping, blood banking and transfusion	Blood groups , Principles of Blood transfusion and banking PY 2.9 Describe different blood groups and discuss the clinical importance of blood grouping, blood banking and transfusion	Erythropoiesis - Linker part B PY 2.5 Describe RBC formation (erythropoiesis & its regulation) and its functions PA 13.1 Describe hematopoiesis and extra medullary hematopoiesis	Role of Iron and Vit A B12 in Erythropoiesis PA 14.1 Describe iron metabolism PA 15.1 Describe the metabolism of Vitamin B12 and the etiology and pathogenesis of B12 deficiency	Heam synthesis and metab PY2.3 Describe & discuss synthesis & functions of Hb & explain its breakdown. Describe Hb variants BI 6.11 Describe the functions of haem in body and describe the processes involved in its metabolism and derangements associated. Porphyrins	Types of hemoglobin and their clinical significance BI 6.12 Describe the major types of Hb and its derivatives found in body and their physiological/ pathological relevance.	Physiology of Hemolysis and Anemia PA 13.3 Define and classify anemia PY 2.5 Describe different types of anemias & Jaundice	Linker Part B of case 1 addresses PY 2.3 , BI 6.12 ,PY 2.9 , PA 13.3 small group discussion + Formative assessment
10 - 11 am	PY 2.9 Group A) Visit to the blood bank Group B) PY 2.11 Blood Grouping cross matching DOAP session	PY 2.9 Group B) Visit to the blood bank Group A) PY 2.11 Blood Grouping cross matching	Peripheral smear examination Group A PY 2.1 Describe the composition and functions of blood and its components OBJ A) Identify RBC , WBC and platelet in normal peripheral smear B) Discuss their functions Group B Visit to Hematology lab / Or ALC animation	Physiology practical Group A PY 2.11 Estimate RBC count and interpret normal Group B PY2.11 Estimate Hb, RBC indices and interpret PA 13.4 Enumerate and describe the normal blood parameters	Physiology practical Group B PY 2.11 Estimate RBC count and interpret normal Group A PY2.11 Estimate Hb, RBC indices and interpret PA 13.4 Enumerate and describe the normal blood parameters	Physiology practicals Group A PY 2.12 Demonstrate the tests for ESR, Hematocrit. Note the findings and interpret the results Group B PY 2.12 Demonstrate Osmotic fragility test . Note the findings and interpret the results	Physiology practical Group B PY 2.12 Demonstrate the tests for ESR, Hematocrit. Note the findings and interpret the results Group A PY 2.12 Demonstrate Osmotic fragility test Note the findings and interpret the results	Skill assessment t PY 2.9, PY 2.11, PY 2.1 , PA 13.4 ,PY 2.12
11-12.00								
1-2 pm	Plasma Proteins PY 2.2 Discuss the origin, forms, variations and functions of plasma proteins	Blood groups , Principles of Blood transfusion and banking PY 2.1 ,2.2 PY 2.9 Formative Assessment Reflective exercise						Feedback-
2-3 pm	Non Aligned sessions in Anatomy					Radiological ANATOMY	Osteology	Remedial
3-4 pm						Surgical Anatomy	Surface Anatomy	
Submissions					PY 2.5 PA 14.1 PA 15.1 Assignment- 1 on Erythropoiesis and factors regulating	PY 2.3 BI 6.11BI 6.12 Assignment 2 on Haem synthesis and metabolism		



Module 5
Skills Training



MEDICAL COUNCIL OF INDIA

COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE

Knows Knows how Shows Shows how Performs

Describe

Enumerate

Observe

Demonstrate

Assist

Counsel



Prescribe

Analyse



Integrate

Guide



Communicate

Correlate



Interpret

Critique

Module 5

Collaborate

Skills Training

Clinician

Communicator

Team Leader

Professional

Lifelong Learner

Knowledge

Skills

Attitude

Values

Responsiveness

Communication

Curriculum Implementation Support Program

Skills Training Module
(Including Guidelines for Skills Lab)

For Undergraduate Medical Education

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2019



Medical Council of India
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BOARD OF GOVERNORS
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Skills module

Foreword

Clinicians are defined by their skill sets. From listening to procedures the continuum of skills that are garnered by learners and doctors are myriad. There is a compelling need to focus on observable and measurable skill acquisition in the MBBS program.

The emphasis on skill acquisition is one of the key features of the competency based curriculum and in many ways is its soul. The competency based undergraduate curriculum provides a framework for learning and assessing skills. The curriculum will necessitate a paradigm shift in medical education in India and requires teachers and education administrators alike to re-think the construct and delivery of instruction, like: 1) what are the skills that must be taught, 2) how to create the right environment in which skills can be taught, practiced, observed and assessed, 3) what are the facilitatory skills that teachers must acquire, 4) how should acquisition of skills be documented, and 5) how would the acquisition or non-acquisition of skills affect the progress of the learner?

A skills lab is a safe environment in which learners can acquire and practice skills and be observed and assessed. A skills lab that provides this environment is an important step in helping learners acquire skills – procedural, communication or others. The establishment of a basic skills lab that is in alignment with the requirements of the competency based curriculum must be established by all medical colleges, if the implementation of the new undergraduate curriculum is to be successfully implemented. This will also provide the faculty with the support mechanisms to adapt to these new changes and requirements.

The skills module developed by the Expert Group of MCI is a compilation of best practices and is a guide to teaching skills needed to implement the competency based curriculum. Institutions, educators and teachers are encouraged to use this guide to help facilitate skill acquisition by learners. We also solicit your innovations and best practices so that these can be shared with institutions and teachers across the nation.

Chairman, Board of Governors

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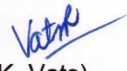
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Foreword
Skills module

A key feature of the Regulations in Graduate Medical Education Part II is the emphasis on an outcome driven education with emphasis on acquisition of competencies. The skills, knowledge and practice acquired by the Indian Medical Graduate to deal with the health problems of the community, particularly in the context of a number of newly emerging and re-emerging diseases, is a challenge to medical educationists. This situation necessitates that the student-learner should have acquired competent and verifiable skills at the time of graduation. Acquisition of these skills, which include cognitive, procedural, and communication skills require dedicated teaching learning practices and time in a supervised environment. The primacy of patient safety also necessitates that practice of skill acquisition, its usage and assessment are done in a safe environment under peer supervision and should be a planned collaborative activity of the institution. The Medical Council of India has thus felt that every medical college should establish an adequately equipped skills lab and provide resources and opportunities so that these can be meaningfully used to improve the skill outcomes of the medical graduate.

This booklet on skills module has been designed to help institutions meet the challenge of transforming the learning environment to align with the requirements of implementation of the competency driven undergraduate curriculum. This module has been written and diligently scrutinised by members of the Expert group. The Medical Council of India hopes that medical institutions would find this a useful resource material as they make the momentous transition to the teaching of the new undergraduate curriculum.


(Dr. R. K. Vats)
Secretary General

Module – 5
SKILLS TRAINING

Skills Training Module

1. Objective of the Document

The objective of the document is to facilitate institutions and faculty to develop and implement skills training as part of implementation of new Undergraduate Curriculum.

2. Glossary of Terms Used in the Document

Skill: Skill is the ability to perform a task leading to a specific predefined outcome.

Skill may be:

- a) Intellectual or cognitive which includes clinical reasoning and decision making skills,
- b) Procedural or psychomotor skills that require manual dexterity and include laboratory and clinical skills,
- c) Communication skills,
- d) Team skills including leadership skills.

Competency: The habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, attitude, values, and reflection in daily practice for the benefit of the individual and the community being served.

Skill Assessment: A session that assesses the skill of the student including those in the laboratory, bed-side, skills lab, skills station that uses mannequins/ paper cases/simulated patients/real patients as the context demands.

DOAP (Demonstration -Observation - Assistance - Performance): A practical session that allows the student to observe a demonstration, assist the performer, perform in a simulated environment, perform under supervision or perform independently.

3. Introduction

The current undergraduate medical education curriculum focuses on competencies and outcomes and gives emphasis to skill development in all phases. The competencies 'Shows How' (SH) or 'Perform' (P) are listed in relation to the skills to be acquired by the learner. The Graduate Medical Education Regulations Part II, 2019 envisages that certain skills are prerequisites for graduation. Therefore, it is necessary for institutions to create skill sessions in which essential/ desirable and certifiable skills are acquired. These skill sessions should be planned during their respective phase in a laboratory/during clinical posting. There should be proper documentation of the process of acquisition of skills. When required, a skills lab may be used to impart training. Skills lab provides a safe training environment in which a learner can be observed and be provided with the feedback necessary to improve. It also allows the learner to do tasks repetitively under supervision till the desired level of competency is achieved.

4. Salient Principles

The undergraduate medical education program is designed with a goal to create an "Indian Medical Graduate" (IMG) possessing the requisite knowledge, skills, attitudes, values and responsiveness, so that he or she may function appropriately and effectively as a physician of first contact of the community while being globally relevant.

The principles governing skill acquisition have been presented in this module which also facilitate the utilization of 'Skills lab' during the undergraduate training and assessment.

This module helps to:

- a) understand the link between competency and skill,
- b) enumerate the general principles of skill acquisition,
- c) explain how to apply these principles,
- d) understand the different methods and steps of skills teaching and acquisition (skill cycle),

- e) develop skill sessions from a given competency, and
- f) impart, assess and document the acquisition of these skills.

The module also elaborates the concepts, processes, resources and organizational set up for a basic skills lab in a college setting.

Context from GMER 2019

2.2.2 All efforts must be made to equip the medical graduate to acquire the skills as detailed in Table 11 Certifiable procedural skills – A Comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) – Indian Medical Graduate.

4.1.4. Clinical training shall emphasize early clinical exposure, skill acquisition, certification in essential skills; community/primary/secondary care-based learning experiences and emergencies.

4.1.6. Acquisition and certification of skills shall be through experiences in patient care, diagnostic and skill laboratories.

4.1.8. Progress of the medical learner shall be documented through structured periodic assessment that includes formative and summative assessments. Logs of skill-based training shall be also maintained.

4.2. Appropriate Faculty Development Programmes shall be conducted regularly by institutions to facilitate medical teachers at all levels to continuously update their professional and teaching skills, and align their teaching skills to curricular objectives.

10.5.1. Initiate appropriate cost-effective treatment based on an understanding of the rational drug prescriptions, medical interventions required and preventive measures.

Certifiable Procedural Skills, as given in GMER 2019 are given below:

Table 11 (GMER 2019): Certifiable Procedural Skills:

A Comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) – Indian Medical Graduate

Specialty	Procedure
General Medicine	<ul style="list-style-type: none">• Venipuncture (I)• Intramuscular injection (I)• Intradermal injection (D)• Subcutaneous injection (I)• Intra Venous (IV) injection (I)• Setting up IV infusion and calculating drip rate (I)• Blood transfusion (O)• Urinary catheterization (D)• Basic life support (D)• Oxygen therapy (I)• Aerosol therapy / nebulization (I)• Ryle’s tube insertion (D)• Lumbar puncture (O)• Pleural and ascitic aspiration (O)• Cardiac resuscitation (D)• Peripheral blood smear interpretation (I)• Bedside urine analysis (D)
General Surgery	<ul style="list-style-type: none">• Basic suturing (I)• Basic wound care (I)• Basic bandaging (I)• Incision and drainage of superficial abscess (I)• Early management of trauma (I) and trauma life support (D)
Orthopedics	<ul style="list-style-type: none">• Application of basic splints and slings (I)• Basic fracture and dislocation management (O)• Compression bandage (I)

Gynecology	<ul style="list-style-type: none"> • Per Speculum (PS) and Per Vaginal (PV) examination (I) • Visual Inspection of Cervix with Acetic Acid (VIA) (O) • Pap Smear sample collection & interpretation (I) • Intra- Uterine Contraceptive Device (IUCD) insertion & removal (I)
Obstetrics	<ul style="list-style-type: none"> • Obstetric examination (I) • Episiotomy (I) • Normal labor and delivery (including partogram) (I)
Pediatrics	<ul style="list-style-type: none"> • Neonatal resuscitation (D) • Setting up Pediatric IV infusion and calculating drip rate (I) • Setting up Pediatric Intraosseous line (O)
Forensic Medicine	<ul style="list-style-type: none"> • Documentation and certification of trauma (I) • Diagnosis and certification of death (D) • Legal documentation related to emergency cases (D) • Certification of medical-legal cases e.g. Age estimation, sexual assault etc. (D) • Establishing communication in medico-legal cases with police, public health authorities, other concerned departments, etc. (D)
Otorhinolaryngology	<ul style="list-style-type: none"> • Anterior nasal packing (D) • Otoscopy (I)
Ophthalmology	<ul style="list-style-type: none"> • Visual acuity testing (I) • Digital tonometry (D) • Indirect ophthalmoscopy (O) • Epilation (O) • Eye irrigation (I) • Instillation of eye medication (I) • Ocular bandaging (I)

Dermatology	<ul style="list-style-type: none"> • Slit skin smear for leprosy (O) • Skin biopsy (O) • Gram's stained smear interpretation (I) • KOH examination of scrapings for fungus (D) • Dark ground illumination (O) • Tissue smear (O) • Cautery - Chemical and electrical (O)
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I- Independently performed on patients,
O- Observed in patients or on simulations,
D- Demonstration on patients or simulations and performance under supervision in patients

Certification of Skills: Any faculty member of concerned department can certify skills. For common procedures, the certifying faculty may be decided locally.

5. Major Components and Structure of the Skill Development program

Skill was the term used traditionally to denote procedural skill. However, there has been a paradigm shift and in the present context, it is the ability to perform a task leading to a specific predefined outcome in several domains.

Classification of Skills-

Skills are classified as:

- a) **Intellectual or cognitive skills** are defined as abilities such as application, analysis and synthesis as building on basic knowledge and are related to underlying component of knowledge.
e.g. ability to interpret haematological tests of a patient with anemia
- b) **Psychomotor or procedural skills** (require manual dexterity and include laboratory and clinical skills
e.g. ability to obtain a blood sample by venepuncture
- c) **Communication skills** is defined as the ability to communicate with others in a given situation.

e.g. ability to motivate volunteers for blood donation

d) **Team Skill** is defined as the ability to work together in a team.

e.g. Ability to work towards implementing a project/operating on a patient with the team.

Link between competency and skills

Competency based medical education is outcome oriented. The learner is expected to be able to demonstrate achievement of predefined outcomes including skills. The competency based curriculum document on skills defines levels of competence for different skills from mere awareness to successful performance (K/KH/SH/P). It is necessary therefore to create learning experiences that will allow the learner to attain the predefined level of outcome. For competencies that require an 'SH', or 'P' level of competence, provision of a learning experience that will allow performance of the skill repeatedly under supervision is critical. It should be also noted that the acquisition of the skill and its correct performance must be documented and assessed.

The general principles of skill acquisition and its application are:

- a) Outcome is predefined for the phase and level of training,
- b) Standard approved process of acquisition including required steps are clearly outlined,
- c) Learners are provided opportunity to progressively acquire and practice repeatedly under supervision, in a structured format and in a safe, non-threatening environment, and
- d) Opportunities are made available for self-assessment and improvement, feedback and assessment of performance.

Developing a skill session from a competency, methods of skill teaching and steps of skill acquisition

It is important to determine the criticality and feasibility of the skill being taught, as given in Figure 1.

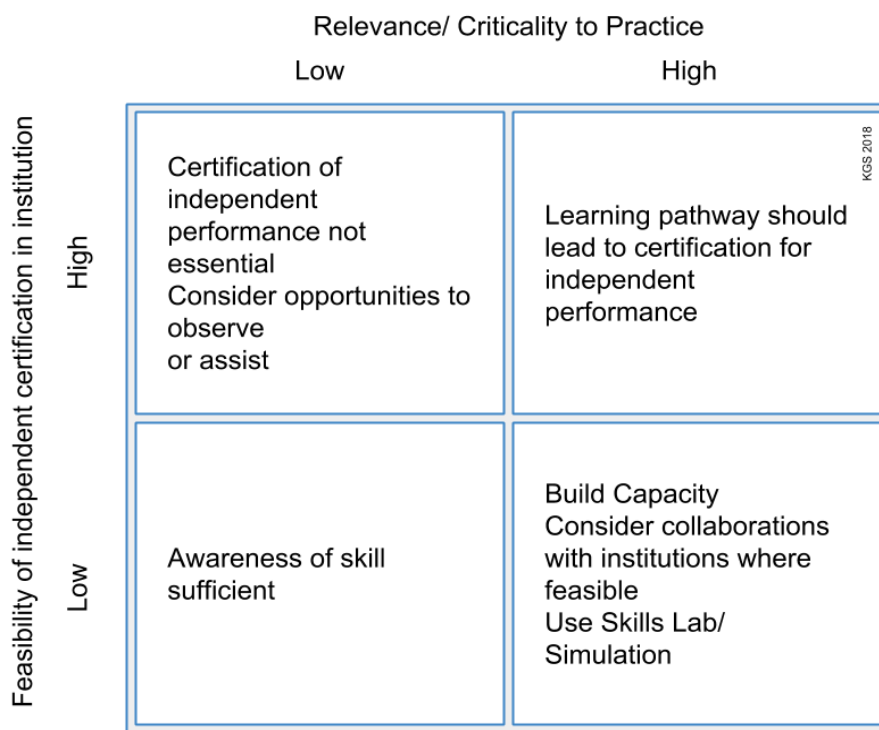


Figure I: Criticality vs feasibility matrix in context to Skills training

Explanation of the criticality vs feasibility matrix with examples from the new undergraduate curriculum:

Example1: Competency of Phase I - PY11.14 -Demonstrate Basic Life Support in a simulated environment.

Domain of 'Skill' at the level of Shows How (SH). Suggested method is DOAP sessions and assessment using OSCE. Now in a real situation, the feasibility of independent performance by a learner may be low, but since the criticality is high, it is a must, to use a Skills lab for training using simulation.

Example 2: Competency of Phase III- EN3.2 - Observe and describe the indications for and steps involved in the performance of diagnostic nasal endoscopy.

Domain of 'Skill' is at the level of Knows How (KH). Suggested method being Lecture, Small group discussion, demonstration and assessment using Written/ Viva voce. Both the feasibility and criticality are low and hence awareness of this skill is sufficient and there is no need for skills training in this competency.

If the competency lends itself to skill acquisition across phases, the phase-wise objectives must be first enumerated. It must be remembered that the ultimate achievement of the competency may be in a later phase but several steps to achieving it phase-wise may be developed.

Example 3: ‘performing and interpreting ECG’:

In phase 1, the competencies related to this skill acquisition are:

PY 5.13: Record and interpret normal ECG in a volunteer or simulated environment-
‘SH’

PY 5.6: Describe abnormal ECG, arrhythmias, heart block and myocardial Infarction-
‘KH’

This skill is also addressed in the competencies of General Medicine and Pediatrics. If we take an example of acquiring this skill in adults, the following competencies in General Medicine are related to performing and interpreting ECG for various disorders:

- IM 1.17: Order and interpret diagnostic testing based on the clinical diagnosis including 12 lead ECG, Chest radiograph, blood cultures - ‘SH’.
- IM 1.18: Perform and interpret a 12 lead ECG - ‘P’.
- IM 2.10: Order, perform and interpret an ECG - ‘P’.
- IM 8.13 Enumerate the indications for and interpret the results of: CBC, Urine routine, BUN, Cr, Electrolytes, Uric acid, ECG - ‘KH’.
- IM 10.18: Identify the ECG findings in hyperkalemia - ‘SH’.
- IM11.11: Order and interpret laboratory tests to diagnose diabetes and its complications including: glucose, glucose tolerance test, glycosylated hemoglobin, urinary micro albumin, ECG, electrolytes, ABG, ketones, renal function tests and lipid profile- ‘SH’.
- IM 12.9: Order and interpret diagnostic testing based on the clinical diagnosis including CBC, thyroid function tests and ECG and radio-iodine uptake and scan - ‘SH’.
- IM12.10: Identify atrial fibrillation, pericardial effusion and bradycardia on ECG - ‘SH’.

In phase 1, while the student acquires the skill of recording and interpreting normal ECG in a volunteer/ simulated environment - to a level of *Shows How* 'SH', he will also gain knowledge of the various abnormal ECGs in arrhythmias, heart block, MI etc. Sensitization of the ECG findings in hyperkalemia, MI, heart failure, thyroid function, diabetes and its complications can also occur at *knows* - 'K' level. This may be achieved during the integration session while conducting teaching learning sessions of PY 5.6,& PY 5.13. It is important to remember that, since the completion of teaching of Phase 1 competency is the priority at this time, the students will be only sensitized to ECG findings in these conditions.

In phase 2, the General Medicine competencies will be dealt in bedside clinics after the students have received preliminary knowledge on these disorders integrated with knowledge in Pathology, Pharmacology, etc. During this phase, phase 2 subjects are primary, but at the same time, the General Medicine competencies are slowly developed towards the requirement of phase 3.

In phase 3, the teaching learning sessions are planned in such a way that each of the competencies mentioned earlier can be slowly progressed to *Shows How / Perform*, as the need may be. Also those competencies requiring a mandatory minimum number of times the skill is to be performed is also required to be documented for each student.

In each phase, learning sessions are derived based on the level of the phase-wise objectives. To ensure a progressive buildup of the competencies to phase 3 at the required level, it is important to have the objectives of phase 3 competencies in place, right at the beginning.

A lesson plan should be made for the learning session that includes objectives, resources, setting (clinical/ laboratory, need for skills lab), learning steps, supervision required, methods of assessment and documentation of the process of the skill acquisition using log/portfolios. These are summarized in Figures II & III.

Figure II: Approach to competency based skill development

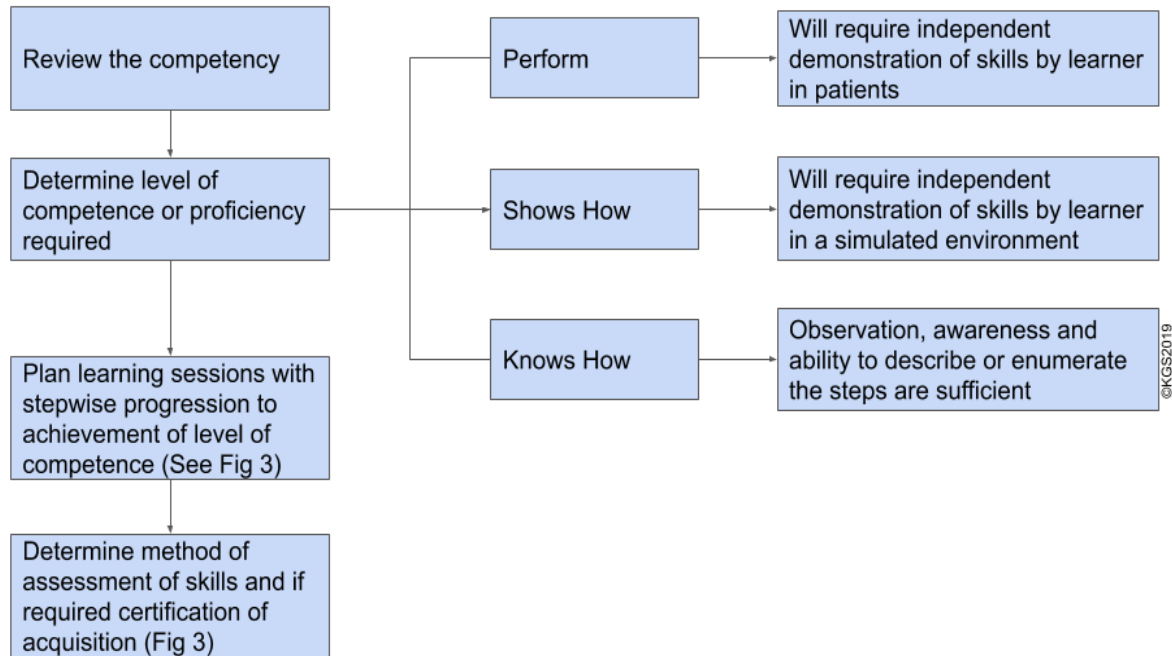
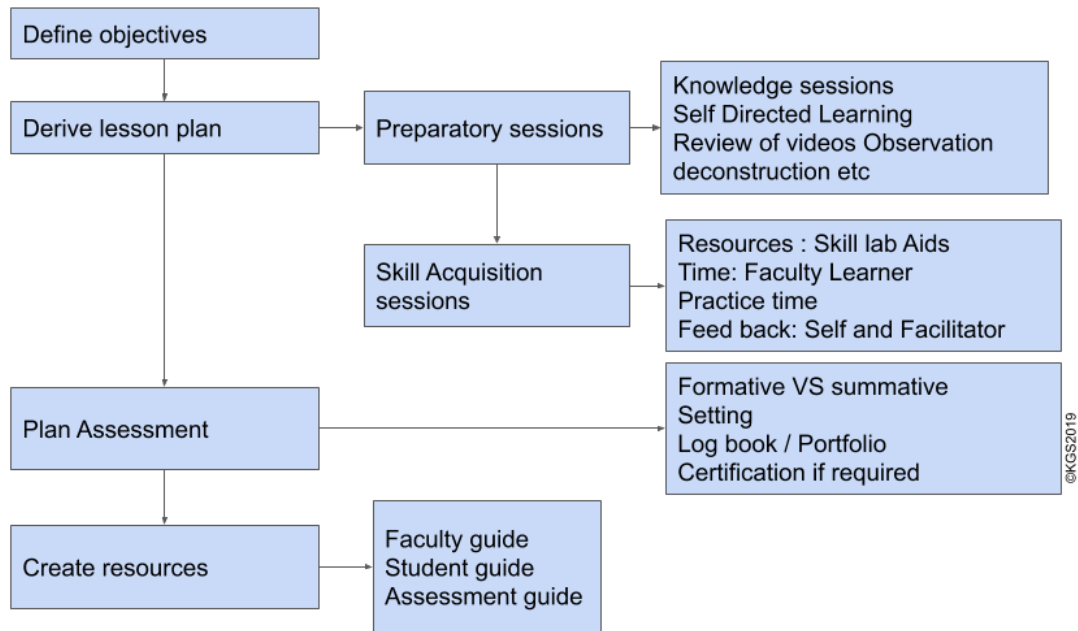


Figure III: Planning a skill session



A template of developing a competency which is skill based is enclosed as **Annexure A (Sample lesson Plan)** which can be used as a guide to various subjects. **Annexure B shows example of task training modules. This can be used by faculty members to develop specific task modules.**

Methods for teaching intellectual skills

Clinical reasoning is best taught during the course of a clinical encounter either conducted by the physician-teacher (for demonstration), or preferably by the student observing a clinical encounter. Clinical case presentations, case based discussions/ chart stimulated recall, clinical problem solving exercises and structured case presentation models like SNAPPS (Summarising, Narrowing the differential, Analyzing the differential, Probing the preceptor, Planning the management & Self-directed learning) and One Minute Preceptor are good settings for teaching clinical reasoning skills.

SNAPPS model can help learners build illness scripts essentially by way of comparing differential diagnoses and clarifications of uncertainties. This method encourages expression of intuitive as well as analytical thinking and promotes self-reflection by the student.

The One Minute Preceptor (OMP) model is another useful model of structured clinical case discussion. In this five-step micro-skills model, the student presents a case, he/she is then asked to commit to a diagnosis, and is probed for reasoning for the same. The preceptor (teacher), now aware of patient as well as student's diagnosis, appreciates what was done well, points out omissions and teaches general rules (e.g. key features, principles of management, effective communication). Usually, it takes about 10 minutes (arbitrary division of time could be: 6 minutes for case presentation, 3 minutes for questioning and 1 minute for teaching the general rule and feedback). Despite being a teacher initiated model, it drives the student to propose and justify the diagnosis, employing appropriate clinical reasoning skills by the learner (Jyoti Nath Modi et al., 2015).

Reflection and metacognition: Students must be encouraged and provided an opportunity to reflect on their diagnostic approach, and think about what they could be missing.

In addition to these methods, there are alternative ways of acquiring intellectual skills such as case discussions, seminars, small group discussions, critical incidence reporting, grand rounds, bed side teaching, assignments, symposia etc. which can be utilized.

Methods for teaching psychomotor skill:

There are various theories and methods of acquiring a psychomotor skill - Few of these methods are described below:

Peyton's Four-Step Approach has proven to be most helpful. Peyton's approach combines multiple aspects of learning theory.

The Four-Step Approach consists of the following four clearly defined steps:

1. The trainer demonstrates the skill in real time without giving instructions or explanatory words ("**Demonstration**").
2. The trainer repeats the procedure, this time describing all necessary sub-steps ("**Deconstruction**").
3. The trainer performs the skill for a third time, this time following the sub-steps only as described to him by the trainee ("**Comprehension**"). This step has been identified as the most important step of the Four-Step Approach in the past as deeper processing mechanisms reflecting what was observed in the first two steps are necessary for the trainees' to be able to give instructions.
4. The trainee performs the skill on his/her own ("**Performance**").

The learning in **Steps 1 and 2** is based on a social-cognitive approach to learning theory, whereas Step 4, the actual implementation and training of the procedure up to its successful application, is associated with the behaviorist learning theory.

The **third step** of Peyton's approach is crucial: The perceptually processed information (Step 1 & Step 2) must be actively manipulated in the working memory in Step 3 to be transferred into the long-term memory (Tobias Münster et al., 2016).

In addition to this method, there are alternative ways of acquiring psychomotor skills such as using demonstration, simulation, skills lab, use of models/ mannequins, performance under supervision, cadaveric labs, animal tissue labs, virtual reality, standardized patients, etc. which can be utilized.

Deliberate practice as elucidated by Ericsson (2004) includes finding opportunities for repeated practice, requesting honest feedback on performance at frequent intervals, maximizing learning from each case, reflecting on feedback and errors to improve performance and using mental practice to support clinical experiences. Deliberate practice involves (a) repetitive practice of the intended skill, combined with (b) the thorough assessment of the skill so that the learner (c) can receive specific, informative feedback, which results in an increasingly (d) better performance of skill. The provision of a safe environment for the learner to be observed while performing skills and providing constructive feedback is the critical component of skill acquisition.

When psychomotor skills training require/ necessitate exposure to body fluids or biological hazardous materials, students must be trained on the infection control / biosafety requirements beforehand. Procedures involving dangerous steps like mouth pipetting should be avoided or replaced with suitable other technologies / methods like bulb suction or vacuum aspiration etc. Use of non-hazardous materials must be encouraged.

Method and theory for communication skills

There are several theories involved in communication skills. A consensus statement from experts called the Kalamazoo declaration provides a simple framework that addresses the essential elements that form healthcare communication. These include

build a relationship; open the discussion; gather information; understand the patient's perspective; share information; reach agreement on problems and plans; and provide closure (Makoul, 2001).

The AETCOM module

The AETCOM module describes the competencies phase-wise and also mentions the suggested teaching learning methods with assessment (from AETCOM module (available at: https://www.mciindia.org/CMS/wp-content/uploads/2019/01/AETCOM_book.pdf), is reproduced below:

AETCOM Module 2.1: The foundations of communication - 2

Background Communication is a fundamental prerequisite of the medical profession and beside skills is crucial in ensuring professional success for doctors. This module continues to provide an emphasis on effective communication skills. During professional year II, the emphasis is on active listening and data gathering.

Competency addressed:

The student should be able to: Demonstrate ability to communicate to patients in a patient, respectful, non-threatening, non-judgmental and empathetic manner.

Level: SH

Learning Experience:

Year of study: Professional year 2

Hours: 5 (1 + 2 +1+1)

- i.* Introductory small group session - 1 hour
- ii.* Focused small group session - 2 hours
- iii.* Skills lab session – 1 hour
- iv.* Discussion and closure – 1 hour

Contents: This module includes 3 interdependent learning sessions:

1. Introductory small group session on the principles of communication with focus on opening the discussion, listening and gathering data.
2. Focused small group session with role play or videos where the students have an opportunity to observe, criticise and discuss common mistakes in opening the discussion, listening and data gathering.
3. Skills lab sessions where students can perform tasks on standardised or regular patients with opportunity for self critique, critique by patient and by the facilitator.

Methods for teaching team Skills

Team skills are enhanced by Immersive Learning. A learner is placed in a situation as a part of a team in an immersive simulated learning environment. His performance is monitored and multilevel feedback is provided, leading to the acquisition and enhancement of skills. For e.g. training students to work in an emergency situation can be taught by simulating an offsite emergency scenario where tasks are allotted to students as a team. The students are allowed to perform. This is observed by experts and following a debrief during which the students are allowed to reflect, they can also be assessed by the experts as a team and such a scenario is used for learning to act as an effective team.

6. Organizational set up

6.1 Guidelines for development of skills lab at medical colleges and training institutions have been detailed in Annexure C.

The basic requirements for a skills lab at a medical college are given below:

Please refer to the Competency Based Undergraduate Curriculum for the IMG, Volumes I-III (2018) for an exhaustive list of subject based competencies which require skill training (accessible at: <https://www.mciindia.org/CMS/wp-content/uploads/2019/01/UG-Curriculum-Vol-I.pdf>)

1. Institutions are encouraged to build capacity over and above these minimum requirements.
2. Institutions within a geographical area or governance can create more advanced shared facilities and resources to reduce cost.

Communication skills training using AETCOM module should be conducted. Resuscitation skills of Basic Life Support (BLS), Advanced Cardiac Life support (ACLS), Pediatric Advanced Life Support (PALS), Neonatal Advanced Life Support (NALS), Advanced trauma Life Support (ATLS), prescription writing and communication skills along with being an effective team member and leader can be taught/trained using offsite simulation of simulated environments in an integrated manner.

Evaluation and Reporting: Program effectiveness questionnaire from faculty and students should be developed. Acquisition and certification of skills shall be through experiences in patient care, diagnostic and skill laboratories. A proper phase-wise logbook is recommended to ensure completion of competencies requiring skills training. Assessment of skills must be planned according to the level of competence desired.

Details can be accessed at

https://mciindia.org/CMS/wp-content/uploads/2019/10/Module_Competence_based_02.09.2019.pdf

6.2 Skill assessment:

Skill assessment is ongoing, formative and summative. Please refer to the module 3 of Medical Council of India on Assessment.

Recommended Reading:

1. Abdulmohsen H and Al-Elq (2007). Medicine and clinical skills laboratories. *J Family Community Medicine*, 14(2): 59–63. Available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3410147/> accessed on 19.11.2019.
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Annexure A

Outline of a Session Plan

Annexure A

Outline of a Session Plan

Name of the group:

Facilitator/ Supervisor/ Faculty:

Parameter	Description
Name of the lesson	
Number of learners	
Objectives of the session	
Primary teaching method chosen	
Break up of the session	Step 1 Step 2 Step 3 Step 4 Step 5
Teaching aids required	
Infrastructure required	
Student preparation required/ prior reading required	
Assessment method chosen	
Other comments	

Annexure B

Examples of Task Training Modules

Annexure B

Examples of Task Training Modules

Example 1: Module for Recording Blood Pressure

Competency in Phase-I:

PY5.12: Record blood pressure & pulse at rest and in different grades of exercise and postures in a volunteer or simulated environment.

Skill training: Recording of blood pressure.

Objectives:

By the completion of this module, the student will be able to:

- Record blood pressure of volunteer by palpatory and Auscultatory method, with sphygmomanometer in right / left upper limb, step wise in sitting / lying down / standing position at rest.
- Suggested Teaching Learning Method: DOAP sessions

Background Knowledge:

PY5.3 Discuss the events occurring during the cardiac cycle

PY5.7 Describe and discuss hemodynamics of circulatory system

PY5.8 Describe and discuss local and systemic cardiovascular regulatory mechanisms

PY5.9 Describe the factors affecting heart rate, regulation of cardiac output & blood pressure

Knowledge about the equipment = Sphygmomanometer, its parts, appropriate size selection and placement.

Equipment/ Instrument/ Other requirement:

- Sphygmomanometer
- Stethoscope

- Volunteer / mannequin
- Hand-outs / check list
- Bed/Couch

Steps in Blood Pressure Recording:

- Patient counselling and consent. Explain to the patient the need for Blood Pressure recording and the procedure. Assess patient's understanding and answer any questions they may have. Respond to the patient's concerns throughout the procedure.
- Check the sphygmomanometer and stethoscope.
- Ensure the equipment mercury column is at zero mark.
- Ensure appropriate position of the patient (sitting on a chair with back supported, feet on the floor, legs uncrossed or lying supine).
- Record Blood Pressure after 5 mins. of inactivity.
- Expose the arm and support it at the level of the heart.
- Palpate the brachial artery in cubital fossa.
- Choose appropriately sized cuff & position the center of cuff's bladder over the brachial artery.
- Wrap the cuff smoothly and snugly around the arm. Cuff should be wrapped in a circular manner one-inch above the level of elbow.
- Correctly palpate the radial artery of the volunteer / or the mannequin with 3 fingers.
- Close the sphygmomanometer valve and inflate the cuff to determine mm Hg at which arterial pulsation can no longer be felt.
- Slowly deflate the cuff by opening the sphygmomanometer valve and note the point where arterial pulsation can be felt again (this is estimated systolic BP).
- Inflate the cuff again to a level 20 – 30 mm Hg more than estimated systolic BP.

- Place diaphragm head of the stethoscope lightly over the brachial artery.
- Deflate the cuff slowly by opening the sphygmomanometer valve so that the pressure falls at 2–3 mm Hg / second.
- Note the mm of Hg pressure at which arterial pulsation / beats can be heard (this is systolic BP).
- Continue deflation and note the mm of Hg pressure at which the last arterial beat is heard (this is diastolic BP).
- Continue deflation for another 10 – 20 mm of Hg past the last heard beat to ensure that the absence of sound is not due to skipped beat.
- Deflate the cuff rapidly and completely.
- If necessary to re-record, wait at least 2 minutes.
- Document the recording in terms of patient position, arm used, cuff size, blood pressure recording.
- Inform the patient of your findings and conclude.

Skill assessment:

OSCE type stations, where observer can observe and assess communication skill (counseling), psychomotor skill and attitude (respond to the patient's concerns, inform the patient of the findings and conclude). This can be done either with check lists or using global ratings.

Suggested Reading:

Books Recommended (latest edition)

1. AC Guyton – Text book of Medical Physiology
2. WF Ganong – Review of Medical Physiology

Example 2: Module for Prescription writing

Competency in Phase-II:

PH3.1: Write a rational, correct and legible generic prescription for a given condition and communicate the same to the patient.

Vertically integrated with General Medicine.

Related Competency in Phase-III:

IM12.14: Write and communicate to the patient appropriately a prescription for thyroxine based on age, sex, and clinical and biochemical status.

Vertically integrated with Pharmacology.

Skill training: Write a prescription taking into consideration appropriate drug/s, appropriate doses, contraindications, drug-drug interactions, side effects and cost.

Objectives:

By the completion of this module, the student will be able to:

- Establish therapeutic goal/s, based on a diagnosis,
- Choose the medicine/s,
- Choose the dose, route and frequency,
- Choose the duration of therapy,
- Write the prescription,
- Inform the patient,
- Monitor drug effects and compliance,
- Review/alter prescription in the light of further investigation.

Suggested Teaching Learning Method: Skill station using case-based scenarios; communication skills can be taught using role play or videos for cases in Indian context.

Background knowledge

Prescribing constitutes a significant component of the job, especially for newly qualified IMG. Prescribing involves a complex chain of competencies (as mentioned above),

each of which demands a combination of knowledge and skill. It also represents the most challenging task for which they have to be prepared. Moreover, the clinical situation in which an IMG has to make a prescription is eternally challenging as more and more medicines with complex pharmacology are available or withdrawn, patient population becoming older and more vulnerable, chances of litigation and a greater need for considering cost-effectiveness as well as the use of generics.

Steps of good prescribing:

The following steps are essential before a prescription is made:

- To have clarity about the reasons for prescribing,
- To obtain patient's medication history (including drugs of alternative systems of Medicine),
- To consider other factors that might alter the benefits and harms of treatment,
- To consider the patient's financial status and expectations (generic prescription),
- To know about efficacy, safety and cost-effectiveness of medicines,
- To know National Guidelines on use of drugs, National List of Essential Medicines (NLEM) and local formularies,
- To be clear about the legality of prescriptions involving narcotics etc. using the correct documentation,
- To monitor the outcome of treatment, both beneficial and adverse,
- To communicate and document prescribing decisions, reasons for them and importance of medication adherence.
- To work within the limitations of one's knowledge, skills, and experience.

Skill assessment: In phase II, this skill requires certification and the required number is also given. Skill assessment using OSCE, log books or portfolios is recommended.

Suggested Reading:

Books Recommended (latest edition)

1. Goodman & Gilman's The Pharmacological Basis of Therapeutics, ed. Laurence Brunton, Bruce A. Chabner, BjornKnollman.
2. Essentials of Medical Pharmacology, by KD Tripathi
3. Davidson's Principles and Practice of Medicine
4. Kumar & Clark: Book of Clinical Medicine

Example 3: Module for Pediatric Intravenous Cannulation

Competency in Phase-III:

PE 15.6: Demonstrate the steps of inserting an IV cannula in a model

Background Information

PE 15.1: Discuss the fluid and electrolyte requirement in health and disease

PE 15.2: Discuss the clinical features and complications of fluid and electrolyte imbalance and outline the management

PE 15.3: Calculate the fluid and electrolyte requirement in health

PE 15.4: Interpret electrolyte report

PE 15.5: Calculate fluid and electrolyte imbalance

PE 24.10: Assess for signs of dehydration, document and present

PE 24.14: Plan fluid management as per WHO criteria

PE 27.5: Describe the etio-pathogenesis, clinical approach and management of shock in children

PE 27.19: Check for signs of shock i.e. pulse, Blood Pressure, CRT

PE 27.21: Choose the type of fluid and calculate the fluid requirement in shock

PE 27.23: Assess for signs of severe dehydration

Introduction

Intravenous access is used when therapies cannot be used or are less effective by alternative routes. Peripheral access is safer, easier to obtain, and less painful than central access. An IMG is required to independently perform pediatric IV cannulation, before being certified.

Suggested Teaching Learning method: Mannequin in a Skills lab

Pre-requisites

Knowledge of superficial veins on the limbs,

Knowledge of indications/ contraindications of IV access,

At least 5 successful supervised practice sessions on arm of rubber mannequin. Should have independently performed at least 02 insertions on an adult patient.

Indications

Replacement of fluids and electrolytes

Blood transfusion

Administration of IV medications

Collection of blood samples

Contraindications

Anatomic disparities

Massive edema

Burns

Cellulitis

Injuries at or proximal to insertion site.

Equipments required:

Gloves, which fit comfortably but are tight, especially at finger tips,

Skin disinfectant (Alcohol Swabs),

22-26 gauge IV catheter / butterfly needle,

Adhesive tape,

Syringe (2 to 10 cc, depending on the age of the child),

Normal saline

Sample collection bottles

Infusion set, elastic tourniquet

Clinical waste dustbin.

Steps in Pediatric intravenous cannulation

Preparation

- Explain the procedure to the child and the family without using technical jargon. Tell about the indication for cannulation.

- Obtain informed or implied consent, following procedure discussion, risks, and benefits. Consider the age and competence of the child for consent or assent to the procedure.
- Select the vein to be cannulated. The vein should be wide, straight, palpable, non-tortuous and non-sclerosed. Avoid veins close to the joints or bony prominences. Avoid using dominant hand or paralyzed limb.
- Always apply universal precautions.
- Both visualize and palpate the vein to be cannulated. There is a slight 'give' over the vessel compared to other tissues.
- Disinfect overlying skin.
- Use appropriate procedures (toys, music, stories etc.) to distract the child during procedure. For a very irritable child, use of oral sedatives may be considered in consultation with the consultant I/C.
- Avoid using the bed for performing the procedure. A procedure room is better. The room should be adequately lighted and have provision for a spot light.
- Select the correct type and size of the cannula, depending on the indication for cannulation. Should be able to identify the size of the cannula by its color coding.
- Have all the equipments on an autoclaved tray.

Procedure

- Seek the assistance of a colleague or a nurse to hold the child's limb.
- Position yourself comfortably. Wear the appropriate size gloves using all antiseptic precautions.
- Apply a tourniquet 2-3inches above the intended site. Check for signs of arterial occlusion like blanching or absence of pulse.
- Instruct the child to clench the fist which will improve venous filling.
- Disinfect the site with appropriate antiseptic swab and allow it to dry naturally.

- Take out the cannula and hold it firmly, bevel side up. Look for any signs of breakage.
- Stabilize the vein by stretching the skin over it.
- Using a 'no-touch' technique, insert the cannula distal to and along the line of the vein keeping it 10-45 degrees to the skin. This will prevent the cannula piercing the opposite wall.

After insertion, check flashback of blood into hub. If blood is seen, advance cannula slightly further without stylet and stabilize. Apply pressure to tip of cannula to stabilize it and remove stylet.

- Release the tourniquet.
- Flush the cannula with normal saline to see the free flow.
- Once in place, lower the cannula so that it is now resting on the skin. Request your colleague to help with securing the cannula using a hypo-allergenic tape. Avoid elastic tapes.
- Connect a 3 way connector/ IV set depending on the indication.
- Start the flow of fluid. Watch for any extravasation of fluid. If it happens, stop the flow. Re-attempt the cannulation at a site proximal to the previous one. Do not make more than 02 attempts. Request a senior colleague if you are not successful even after 02 attempts.
- Apply a clean splint to stabilize the limb. Dress with a sterile dressing.
- Fingers/toes should not be covered and remain visible.
- Write the date and time of insertion on a sticker and place over the dressing.

Complications

- Thrombosis
- Hemorrhage
- Phlebitis
- Local site infection

- Extravasation of fluids/medications
- Counter puncture of the vessel wall
- Gangrene of fingers/toes

Assessment:

The procedure is to be assessed by a faculty member using DOPS format and feedback provided.

Suggested Reading:

Books Recommended (latest edition)

1. PG Textbook of Pediatrics, IAP P Gupta et al (Editors)
2. Clinical Methods in Pediatrics, P Gupta
4. Davidson's Principles and Practice of Medicine
5. Kumar & Clark: Book of Clinical Medicine

**Example 4: TRAINING MODULE FOR URINARY BLADDER CATHETERISATION
(Male & Female)**

Competency in Phase III Part 1 and 2

1. Competency No:

OG35.17	Demonstrate the correct technique of urinary catheterisation in a simulated/ supervised environment	S	SH
SU29.7	Describe the principles of management of acute and chronic retention of urine.	K	KH
OR13.2	Participate as a member in team for resuscitation of Polytrauma victim by doing all of the following : (a) I.V. access central - peripheral (b) Bladder catheterization (c) Endotracheal intubation (d) Splintage	S/A	KH / SH

2. Objectives:

By the completion of this module, the student will be able to:

- a. List the indications for urinary catheterisation (K)
- b. Select the equipment for female/male urinary catheterization and choose appropriate catheter type/size (SH)
- c. Enumerate the risks associated with catheterization (K)
- d. Communicate to the patient about the procedure and care of catheter, including the need for aseptic care (SH)
- e. Demonstrate correct method of urinary catheterization with strict aseptic technique in mannequin as well as in patients (male & female) (SH).

3. Background Knowledge:

AN52.2	Describe & identify the micro-anatomical features of: <u>Urinary system:</u> Kidney, Ureter & Urinary bladder <u>Male Reproductive System</u> Testis, Epididymis, Vas deferens, Prostate & penis <u>Female Reproductive system</u> Ovary, Uterus, Uterine tube, Cervix, Placenta & Umbilical cord	K/S	SH
AN48.6	Describe neurological basis of Automatic bladder	K	KH
PY7.6	Describe the innervations of urinary bladder, physiology of micturition and its abnormalities	K	KH
IM18.8	Describe and distinguish based on the clinical presentation, the types of bladder dysfunction seen in CNS disease	K	KH
SU29.7	Describe the principles of management of acute and chronic retention of urine.	K	SH
SU29.9	Describe the clinical features, investigations and principles of management of disorders of prostate.	K	KH
SU29.11	Describe clinical features, investigations and management of Urethral strictures	K	KH
PM7.6	Enumerate the indications and describe the pharmacology and side effects of commonly used drugs in neuropathic bladder	K	KH

4. Setting/Equipment/ Instrument/ other requirements:

Catheterization tray consists of disposable sterile gloves, one fenestrated drape, lubricant, cotton balls with container, artery forceps (2), prefilled 10cc syringe with sterile water to inflate the balloon, sterile specimen container for urine sample collection; sterile catheter, latex (rubber) or silicone: 2 way or 3 way (where possible, select the non-latex

catheter), chlorhexidine 2% aqueous solution, Sterile water, catheter-secure device or adhesive tape, urinary drainage bag.

Choosing the appropriate catheter depends on

- i. The size of the patient's urethral canal
- ii. The expected duration of catheterization (e.g. intermittent or indwelling)
- iii. Knowledge of any allergies to latex or plastic and cleansing solutions

Catheter diameters: 5Fr, 6Fr, 8Fr 10Fr, 12Fr, 14Fr, 16Fr, 18Fr, 20Fr, 22Fr, 24Fr, 26Fr.

Commonly used range is from 12 to 16 Fr

The higher the number the larger the diameter of the catheter.

3Fr. = 1mm (i.e. a 24fr. catheter is 8mm in diameter)

5. Procedure Steps: (can be used to prepare check list)

Communication:

Prior to starting, explain to the patient about the need and process of urinary catheterization. Assess patient's understanding and answer any questions they may have. Check consent for procedure. Explain about the care of catheter after insertion also.

Steps in female catheterization

- Place the patient in the supine position with the knees flexed and separated and feet flat on the bed, about 60 cm apart. If this position is uncomfortable, instruct the patient either to flex only one knee and keep the other leg flat on the bed, or to spread her legs as far apart as possible. A lateral position may also be used for elderly or disabled patients. Drape the patient appropriately using the sterile drapes provided.

- With the thumb, middle and index fingers of the non-dominant hand, separate the labia majora and labia minora. Pull slightly upward to locate the urinary meatus. Maintain this position to avoid contamination during the procedure.
- With your dominant hand, cleanse the urinary meatus, using forceps and chlorhexidine soaked cotton balls. Use each cotton ball for a single downward stroke only.
- Place the drainage basin containing the catheter between the patient's thighs.
- Pick up the catheter with your dominant hand.
- Insert the lubricated tip of the catheter into the urinary meatus.
- Advance the catheter about 5-5.75 cm, until urine begins to flow, then advance the catheter a further 1-2 cm.
- **Note:** If the catheter slips into the vagina, leave it there to assist as a landmark. With another lubricated sterile catheter, insert into the urinary meatus until you get urine back. Remove the catheter left in the vagina at this time.
- Attach the syringe with the sterile water and inflate the balloon. It is recommended to inflate the 5cc balloon with 7-10cc of sterile water, and to inflate the 30cc balloon with 30-35cc of sterile water.
- If resistance is met during advancement of the catheter, pause for 10-20 seconds. Instruct the patient to breathe deeply and evenly. Apply gentle pressure as the patient exhales.
- Improperly inflated balloons can cause drainage and leakage difficulties.
- Gently pull back on the catheter until the balloon engages the bladder neck.
- Attach the urinary drainage bag and position it below the bladder level. Secure the catheter to the thigh. Avoid applying tension to the catheter.
- Remove drapes and cover patient. Ensure drainage bag is attached to bed frame. Remove your gloves and wash hands.

Steps in male catheterization

- Place the patient in the supine position with legs extended and flat on the bed.
- Prepare the catheterization tray and catheter and drape the patient appropriately using the sterile drapes provided. Place the fenestrated (drape with hole) drape over the penis.
- Apply water-soluble lubricant to the catheter tip.
- With your non-dominant hand, grasp the penis just below the glans and hold upright.
- If the patient is uncircumcised, retract the foreskin. Replace the foreskin at the end of the procedure.
- With your dominant hand, cleanse the glans using chlorhexidine soaked cotton balls. Use each cotton ball for a single circular motion.
- Place the drainage basin containing the catheter on or next to the thighs.
- With your non-dominant hand, gently straighten and stretch the penis. Lift it to an angle of 60-90 degrees. At this time, you may use the gel to anesthetize the urinary canal, which will minimize the discomfort.
- With your dominant hand, insert the lubricated tip of the catheter into the urinary meatus.
- Continue to advance the catheter completely to the bifurcation i.e. until only the inflation and drainage ports are exposed and urine flows (this is to ensure proper placement of the catheter in the bladder and prevent urethral injuries and hematuria that result when the Foley catheter balloon is inflated in the urethra).
- **Note:** If resistance is met during advancement of the catheter, pause for 10-20 seconds. Instruct the patient to breathe deeply and evenly. Apply gentle pressure as the patient exhales.
- If you still meet resistance, stop the procedure and repeat above steps with a smaller size.

- Attach the syringe with the sterile water and inflate the balloon. It is recommended to inflate the 5cc balloon with 7-10cc of sterile water, and to inflate the 30cc balloon with 35cc of sterile water. Improperly inflated balloons can cause drainage and leakage difficulties.
- Gently pull back on the catheter until the balloon engages the bladder neck.
- Attach the urinary drainage bag and position it below the bladder level. Secure the catheter to the thigh. Avoid applying tension to the catheter.
- Remove drapes and cover patient. Ensure drainage bag is attached to bed frame. Remove your gloves and wash hands.
- **Note:** Never inflate a balloon before establishing that the catheter is in the bladder and not just in the urethra. If the patient reports discomfort, withdraw the fluid from the balloon and advance the catheter a little further, then re-inflate the balloon.

Risks associated with catheterization include:

- a. Urethral trauma and bleeding from inappropriate catheter size or use of force.
- b. Urinary tract infections related to poor sterile technique or long-term catheterization.
- c. Bladder spasms and pain.

Skill assessment:

- i. **Formative:** Demonstration of successful urinary bladder catheterization in a mannequin with demonstration of all aseptic precautions (5 times).
- ii. **Summative:** Demonstration of successful urinary bladder catheterization in male and female patients with demonstration of all aseptic precautions (5 times each) during internship.

Example 5: Module for Consent taking and documentation

Competency in Phase-III:

Relevant Competencies:

FM 4.19	Define Consent. Describe different types of consent and ingredients of informed consent. Describe the rules of consent and importance of consent in relation to age, emergency situation, mental illness and alcohol intoxication.	K	KH
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SU 10.2	Describe the steps and obtain informed consent in a simulated environment	S/A/ C	SH
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IM26.15	Identify, discuss and defend, medico-legal, socio-cultural and ethical issues as they pertain to consent for surgical procedures	K	KH
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EN 2.12	Counsel and administer informed consent to patients and their families in a simulated environment	S/A/C	SH
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Prior competencies

FM2.32	Demonstrate ability to exchange information by verbal, or nonverbal communication to the peers, family members, law enforcing agency and judiciary	A and C	KH
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IM26.35	Demonstrate empathy in patient encounters	S	SH
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SU8.2	Demonstrate Professionalism and empathy to the patient undergoing General surgery	A/C	SH
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PS1.1	Establish rapport and empathy with patients	A/C	SH
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Skill training: Counsel and administer informed consent prior to lumbar puncture to a patient and family in a simulated environment.

Objectives:

By the completion of this module, the student will be able to:

- i. Demonstrate good communication skills and empathy,
- ii. Counsel a patient regarding the purpose, steps and complications related to lumbar puncture,
- iii. Obtain informed consent,
- iv. Document the informed consent as per legal requirements.

Suggested Teaching Learning Methods:

- Lecture regarding the definition, importance, legal aspects of the consent taking process;
- Skill station using case based scenarios;
- Communication skills taught using role play or videos for cases in Indian context; documentation using structured exercises and critics.

Background knowledge

The IMG should be aware of the need and advantages, steps to perform, and consequences of lumbar puncture in a patient suspected to have meningitis or similar illnesses. She / He should know about the rights of the patient to be informed about (a) the procedure, (b) alternatives to the procedure, and (c) right for refusal (autonomy) without treatment being affected. The importance of proper documentation of the informed consent should be emphasized. The communication skills, attitude, ethics and knowledge domains should also be discussed.

Steps for consent taking:

The following steps are essential:

- The student should have completed communication skills training and counselling exercises and must be capable of demonstrating empathy.

- The students should have thorough knowledge of the indications, anatomical and physiologic basis and the consequences of the procedure to be followed.
- The student shall discuss the above information in a language that is understandable to the patient (simulated in skill lab). The student should consider the patient's educational status and expectations and be open to questioning.
- The student shall emphasize the advantages of the procedure to convince the patient and family, but should also make them understand of their right to refusal, without the treatment being affected.
- The student shall describe about the legality of informed consent.
- Perform the correct documentation including writing the consent by hand in vernacular with signatures of patient, legally authorized representative or parent (as the case may be) and countersigned by the witness and the clinician with date, time etc..
- The training can also include critics of few consent documents from various situations and departments (like General Medicine, General Surgery, Pediatrics, Obstetrics & Gynaecology, Radiodiagnosis, Oncology etc.)
- The student can also be introduced to consent taking in relation to recruitment of subjects in research as well (Competency No. IM 26.49 administer informed consent and appropriately address patient queries to a patient being enrolled in a research protocol in a simulated environment)

Skill assessment: This skill requires certification. Skill assessment is recommended using affective OSCE (using simulated patients), written exercises, logbooks or portfolios.

Example 6: Module for Suturing a wound– simple sutures

Relevant competencies:

- SU14.3 Describe the materials and methods used for surgical wound closure and anastomosis (sutures, knots and needles).
- SU14.4 Demonstrate the techniques of asepsis and suturing in a simulated environment
- Regulations on Graduate Medical Education, Part II, 2019 - Table 11:

Certifiable Procedural Skills: General Surgery: **Basic suturing**

Objectives:

By the completion of this module, the student will be able to suture a wound by simple suture in a simulated environment.

- Suggested Teaching Learning Method: DOAP sessions

Background Knowledge:

SU5.1 Describe normal wound healing and factors affecting healing.

SU5.2 Elicit, document and present a history in a patient presenting with wounds.

SU5.3 Differentiate the various types of wounds, plan and observe management of wounds.

SU5.4 Discuss medico-legal aspects of wounds.

Knowledge about different suture materials, advantages, disadvantages, selection of appropriate suture material.

Wound cleaning and administration of local anesthesia.

Equipment / Instruments / other requirements:

Suturing task training models / part mannequins.

Appropriate Suture material like 2-zero nylon/silk with atraumatic reverse cutting needle.
Suturing Instruments – Thumb forceps, Needle holder and scissors.

	Steps for simple suturing - can be used as check list	Performed Correct = ✓ Not correct= X	Remarks
1	Explain to patient or relatives regarding need of procedure and record informed consent.		
2	Clean the wound and surroundings with appropriate antiseptic solution and maintain asepsis during procedure. Wear well-fitting surgical glove.		
3	Local or general anaesthesia is given / tested/ confirmed		
4	Hold the toothed forceps with non-dominant hand to grasp the skin edges. If necessary, debride edge		
5	Hold a needle holder in dominant hand by partially inserting the thumb and ring fingers into the loops of the handle		
6	Needle grasped at its centre or 50 – 60 % back from pointed end.		
7	The needle grasped 1-2 mm from the tip of needle holder.		
8	Placement of the 1 st suture is begun by grasping the skin edge, slightly everting and needle entering perpendicular from outside-in 1.5 cm from the edge of the wound.		
9	The needle is re-grasped with forceps after being driven through the full thickness of the skin from outside in.		
10	Same technique is followed on the other skin edge exactly opposite to the previous bite from inside out.		
11	The suture material is drawn through the skin leaving 2-3 cm protruding from the skin surface.		
12	The long strand is wrapped around needle holder to form loop for throw.		
13	The short strand is grasped and pulled through the loop to form a square knot, just tight enough to approximate the wound edges.		
14	The second throw of the square knot is initiated with the long strand warped around the needle holder.		
15	Hold the short end with the needle holder and pull the strand out to make a knot and tightened securely over the first knot.		
16	The suture material is cut with scissor 1 – 2 cm away from the knot.		
17	The procedure is repeated 1.5 cm away.		
18	Wound is cleaned, local antibiotic ointment/ cream is applied and proper dressing is given.		
19	Patient is explained about postoperative care.		

Skill assessment:

OSCE type stations, where observer or their group members can observe with a check list.

Note: Apart from the Psychomotor skill, the module can be further expanded to include communication skill (counseling, obtaining consent) and attitude (respond to the patient's concerns, inform the patient of your findings and conclude). This can be done either with check lists or by using global ratings.

Annexure C

Guidelines for development of skills lab at medical colleges

Annexure C

6.1 Guidelines for development of skills lab at medical colleges:

1. Every medical institution must provide students access to a skills laboratory where they can practice and improve skills pre-specified in the curriculum.
2. The purpose of the skills lab is to provide a safe and non-threatening environment for students to learn, practice and be observed performing skills in a simulated environment thus mitigating the risks involved in direct patient exposure without adequate preparation and supervision.
3. The skills lab attempts to recreate the clinical environment and tasks which future health care workers have to perform with various levels of complexity and fidelity.
4. Skills labs are used to enhance - clinical, psychomotor and communication skills - as well as teamwork.
5. The skills lab that fulfills the requirements of the outcomes in undergraduate curriculum should contain, at the minimum, the following:
 - a. The skills lab should have a total area of at least 2000 sqft for 100 students, there must be a facility for minimum of 04 rooms (preferably 08) for examination of patients or standardized/ simulated patients.
 - b. The skills lab should be equipped with a facility for video recording and review of the interaction. This is vital for teaching communication skills.
 - c. A room for demonstration of skills to small groups,
 - d. A review or debriefing area,
 - e. Stations for practicing skills individually or in groups,
 - f. Trainers or mannequins required to achieve skills outlined in the competency based undergraduate curriculum document,
 - g. Adequate storage space for storage of mannequins and/or other equipments,

- h. A room for faculty coordinator, and for support staff.
- i. Dedicated technical officer and support staff must be available.

6.2 Suggested facilities in Skill Labs (for 100 students) by the start of Phase 1 in all medical colleges

Part Time task trainer simulators / models / mannequins for:

- First aid, Bandaging, splinting; n=4
- Basic Life Support (BLS), CPR (Cardio Pulmonary Resuscitation) mannequin: n=4
- Various types of injections- Subcutaneous, Intra-muscular, Intra-venous; n=5
- Urine Catheter insertion; n =4
- Skin & Fascia suturing n=5
- Breast examination model /mannequin
- Gynecological examination model / mannequin including IUCD (Intra Uterine Contraceptive Device) Training model
- Obstetrics mannequins including Obstetric examination, conduct and management of vaginal delivery.
- Neonatal & Pediatric resuscitation mannequins
- Whole body mannequins, Trauma mannequin (Optional)

Each model (Low or High Fidelity) should have a module for training including objectives, methods and assessment. Modules can also have hybrid models where real patients or standardized/simulated patients/ computer simulations can be used.



Logbook Guidelines



MEDICAL COUNCIL OF INDIA

COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE

Knows Knows how Shows Shows how Performs

Describe Enumerate Observe Demonstrate Assist

Counsel

Integrate

Analyse

Logbook Guidelines

Interpret

Guide

Communicate

Critique

Clinician

Communicator

Team Leader

Professional

Lifelong Learner

Knowledge

Skills

Attitude

Values

Responsiveness

Communication

Curriculum Implementation Support Program

Guidelines for preparing Logbook

for

Undergraduate Medical Education Program



**Medical Council of India
Pocket-14, Sector-8, Dwarka,
New Delhi 110 077**

This booklet has been prepared by the Expert Group nominated by the Board of Governors in supersession of the Medical Council of India, for use by faculty members / institutions / Universities. These guidelines for recording logbook entries are recommended to be followed for the MBBS students from the academic year 2019-20 onwards. This module aims to create a standard protocol for documenting the achievement of selected competencies listed in the Competency Based UG Curriculum (2018) and the Regulations on Graduate Medical Education, 2019, Part II.

The instructions given herewith are guidelines only for the colleges / Universities and can be adapted / modified as per requirements.

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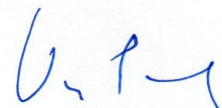
Guidelines for preparing Logbook

Foreword

The competency driven curriculum places great emphasis on the acquisition of a pre-defined set of knowledge, skills, attitude and values that would allow the learner to become a physician of first contact in the community. Traditional summative assessment is not sufficient to ensure that the learner has indeed acquired requisite competencies. A formative process that documents the progression of the learner in the acquisition of competencies by him or her therefore becomes a necessary and integral tool. As defined in this booklet, the logbook is a *verified record* of the progression of the learner documenting the acquisition of the requisite knowledge, skills, attitude and/or competencies. The logbook thus is an academic document that becomes both a snap shot of the progress of the learner as well as a prerequisite for progression to the next phase of learning or graduation from the course.

This booklet provides a guide as well as examples on how the traditional logbook can be modified to work in alignment with the principles of the competency driven curriculum. Importantly, it illustrates through example, planning of activities, derivation of components of the activity, criteria for successful completion, remedial and feedback into the log table. This sample may be used and adapted as required for the local needs of colleges.

This sample booklet has been developed by the curriculum expert group based on the needs of the competency driven curriculum. As we gain experience with the curriculum we are keen to learn best practices from colleges across the nation and how institutions have adapted the logbook to help their learners.


Chairman, BOG

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भारतीय आयुर्विज्ञान परिषद्
MEDICAL COUNCIL OF INDIA
BOARD OF GOVERNORS
IN SUPERSESSION OF MEDICAL COUNCIL OF INDIA

Guidelines for preparing Logbook
Foreword

This booklet has been developed by the curriculum expert group to help institutions to create a logbook that documents the undergraduate student's acquisition of skills and record of other important activities required as part of the academic program. Completion of the activities specified and submission of the certified logbook is a **prerequisite** for a student to apply for the end of phase summative examination.

This booklet provides a sample template for the logbook as well as a simple log table that will allow institutions to document and act on various activities that are required by students to complete the course. It also emphasises the need for feedback and remedial action when required to be taken by the students.

The templates provided here can be adapted by institutions in print or in the electronic format. Logbooks can be created phase -wise or subject - wise. Evidence for the activities in the logbook can be maintained in a portfolio or as an Annexure to the logbook.

The logbook is an important document recording the student's progress. The suggested log format supports objectives enunciated in the competency driven undergraduate curriculum by helping document competency acquisition by the learner.

Vats

(Dr. R. K. Vats)
Secretary General

Logbook for the MBBS Curriculum

Introduction

A key aspect of the new Competency Based UG Curriculum is the emphasis on acquisition of competencies as a requisite for progression in the course. Active learning process by the student and his/her progression to achievement of competencies / pre-determined tasks need to be documented. A record of activities completed and competencies acquired is necessary to ensure that the learner has acquired the key competencies. The logbook forms an integral part of the formative / continuous assessment program. This document outlines the means and processes to create and record such activities in the form of a unified logbook. The process is illustrated using examples based on the principles of formative evaluation. This is a suggested format. Institutions can develop their own process and records based on local requirements incorporating the major elements outlined in this document.

Glossary

Logbook: is a *verified record* of the progression of the learner documenting the acquisition of the requisite knowledge, skills, attitude and/ or competencies.

Portfolio is a collection of learner's progression in tasks and competencies. A portfolio is an evidence of events documented in the logbook. It includes selected assignments, self-assessment, feedback, work-based and in-training formative assessments, reflections and learnings from planned activity in the curriculum. **The maintenance of portfolio is desirable. If portfolio is not possible to be maintained, an annexure to logbook can be used for documenting details.**

Activity: This term refers to a predefined task performed by learners that contributes to the achievement of stated objectives or competencies.

Remedial: Remedial is a planned activity aimed at correcting deficits that prevent a learner from achieving an intended outcome.

Feedback: Feedback is a formal active interaction performed at the completion of an observed activity (or activities) intended to facilitate positive change, growth and improvement of the learner through guided reflection of activity (ies) performed.

The faculty will determine the competencies that need to be part of the logbook. Skill competencies that have Performance '(P)' automatically qualify to be in the logbook most of the time. Selected skill competencies with Shows How '(SH)' in the psychomotor and communications domains will require a logbook entry.

Certain competencies which require documentation of self-directed learning - reflections, narrative and creative writing experiences, participation in group activities such as seminars, symposia etc. may be included in the logbook. Competencies that require documentation of collected clinical or laboratory experiences, predetermined patient or community interactions such as field visits may also be included in the logbook. Successful documentation and submission of the logbook is a prerequisite for being allowed to take the final summative examination (GMER 11.1.1.b.7).

The competencies addressed during Foundation Course should be entered in the logbook of the first professional year. Since AETCOM is a longitudinal program, it should find a place in the logbook of each professional year or have its own logbook spreading across the years.

Whether logbooks are maintained subject-wise or phase-wise, in print or in electronic format is left to the discretion of individual institutions. It is important that the logbook reflects the spirit and purpose of the Competency driven Curriculum, captures and documents the acquisition of chosen competencies and the progress of the student without being unwieldy and inefficient. While it is tempting to enter the acquisition of each and every competency in logbook, this will lead to a drain on faculty time and is best avoided. Hence, many 'K' (Knows) and 'KH' (Knows How) competencies may be left out, unless they lead to activities mentioned above.

Note that all elements of the competency need not be addressed by an activity. Also, the objectives of the competency need not be met in one session. Often multiple sessions are required with progressive enhancement of knowledge or skills leading to the acquisition of the competency. Indeed, this can take place in sessions spread over two or more phases.

The faculty will determine the level of achievement or criteria that will determine satisfactory (meets expectations) completion of the activity and contribute towards the acquisition of the competency. The faculty will use a numerical score but should determine the pass or satisfactory score. The faculty will also prescribe what a learner should do if he or she does not meet the expectations and hence has not successfully completed the activity i.e. should he or she repeat the activity? should there be remedial training after x number of repeats? etc.

The performance of the learner must be transferred to the log table (see tables 1, 2 and 3 for professional year 1) . Explanation for each column in the table is provided after Table 3.

Table 1. Sample template of Logbook page in Human Anatomy

Subject: Human Anatomy

First Year MBBS

Sub Item: Dissection / Histology / Museum sessions / Vertical Integration / Early Clinical Exposure / Seminar / Self Directed Learning

1	2	3	4	5	6	7	8
Competency # addressed	Name of Activity	Date completed: dd-mm-yyyy	Attempt at activity First or Only (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty and date	Feedback Received Initial of learner

Separate sheet(s) for Foundation Course, AETCOM, Humanities, Sports, extracurricular activities, subjects (as in the index), needed.

(This table can be replicated in as many pages, as needed)

Table 2. Sample template of Logbook page in Biochemistry

Subject: Biochemistry

First Year MBBS

Sub Item: Practicals (Student Lab.) / Practicals(Clinical Lab.) / Vertical Integration / Early Clinical Exposure / Seminar / Self Directed Learning

1	2	3	4	5	6	7	8
Competency # addressed	Name of Activity	Date completed: dd-mm-yyyy	Attempt at activity First or Only (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty and date	Feedback Received Initial of learner

Table 3. Sample template of Logbook page in Physiology

Subject: Physiology

First Year MBBS

Sub Item: Practicals (Student Lab.) / Practicals(Human Physiology) / Vertical Integration / Early Clinical Exposure / Seminar / Self Directed Learning

1	2	3	4	5	6	7	8
Competency # addressed	Name of Activity	Date completed: dd-mm-yyyy	Attempt at activity First or Only (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty and date	Feedback Received Initial of learner

Explanation of each column in the logbook table (Tables 1, 2, 3 above)

1. The **number** of the competency addressed includes the subject initial and number (from Vol. I, II, or III of the UG Curriculum)
e.g., AN 2.1
2. **Name of activity** -
e.g., Seminar on Liver or Group discussion or Session 1 of CPR (if the institution has numbered each activity, the number may be entered)
3. **Date the activity gets completed**
4. **Attempt at activity by learner:** Indicate if:
 - a. First attempt (or) only attempt
 - b. Repeat (R) of a previously done activity
 - c. Remedial activity (Re) based on the determination by the faculty
5. **Rating - Use one of three grades:**
 - a. Below expectations (B);
 - b. Meets expectations (M)
 - c. Exceeds expectations (E)
6. **Decision of faculty**
 - a. C: activity is completed, therefore closed and can be certified, if needed
 - b. R: activity needs to be repeated without any further intervention
 - c. Re: activity needs remedial action (usually done after repetition did not lead to satisfactory completion)
7. Initial (Signature) of faculty indicating the completion or other determination
8. Initial (Signature) of the learner if feedback has been received.

The logbook shall have pages dedicated to participation in Foundation Course (in first phase) and AETCOM activities (in all phases). There can be a logbook for each phase, which must be submitted before the examination and available for university examiners to review, if necessary or at random. If the subjects are included in more than one phase (e.g. Community Medicine, General Medicine etc.), the subjects can have a logbook covering various competencies (activities) in all phases.

The final summary page at the end of the logbook (see appendix 1) can have a quantitative expression as to the percentage of achievement of competencies at various levels. This page may be replicated in logbooks of subsequent phases (unless a common book is used). **The sample templates given above pertain to the first Phase of the MBBS course but can be modified and used for other phases as well.**

Illustrative Examples

1. Psychomotor skills

An example of a psychomotor skill that has to be acquired in Phase 1 is given here step-wise, from identifying the competency to the logbook entry required.

1. Competencies identified:

- a. PY6.8: Demonstrate the correct technique to perform & interpret Spirometry.
- b. PY6.9: Demonstrate the correct clinical examination of the respiratory system in a normal volunteer or simulated environment.
- c. PY6.10: Demonstrate the correct technique to perform measurement of peak expiratory flow rate in a normal volunteer or simulated environment.

It is desirable to break down the competency into objectives so that learning sessions can be devised accordingly

2. Name of activity: Examination of the Respiratory System in normal persons.

3. Components of activity:

- a. Attend teaching session on PY6.7. Describe and discuss lung function tests & their clinical significance.
- b. Attend practical session on examination of the respiratory system and measurement of lung function.
- c. Review video available (optional).
- d. Demonstrate (by student) examination of the respiratory system, incentive spirometry and peak expiratory flow rate in a volunteer or standardised patient accurately.
- e. Interpret a set of given patterns of Pulmonary Lung Function Tests (PFTs) accurately.

4. Criteria for successful completion of activity

- a. Demonstration of examination and procedure as pre-specified.
- b. Interpretation of PFT patterns provided accurately.

5. Numerical scoring for activity

Not required.

6. Documentation of activity in portfolio or Annexure of logbook

Not required.

7. Recommended action when learner is unsuccessful

- a. Provide feedback
- b. Allow repeat
- c. If repeat x 2 is unsuccessful, learner must review video available / work with the faculty prior to retaking the activity.

8. Any other comments

Equipment required to be listed

Sample logbook entry for psychomotor skills (see Tables 4 & 5)

Table 4: Sample logbook entry for psychomotor skills where the student has successfully completed the activity

Subject: Physiology

First Year MBBS

Sub Item: Practicals (Physiology)

1	2	3	4	5	6	7	8
Competency # addressed	Name of Activity	Date dd-mm-yyyy	Attempt at activity First or Only (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations Or Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)*	Initial of faculty and date	Feedback Received Initial of learner
PY6.8	Demonstrate the correct technique to perform & interpret Spirometry	18-09-2019	F	M	C		
PY6.9	Demonstrate the correct clinical examination of the respiratory system in a normal volunteer or simulated environment	19-09-2019	F	M	C		
PY 6.10	Demonstrate the correct technique to perform measurement of peak expiratory flow rate in a normal volunteer or simulated environment	20-09-2019	F	M	C		

Table 5: Sample logbook entry for psychomotor skills where the student has not successfully completed the activity

(S)He had to repeat it. And he or she has completed it a week later. Then the logbook entry will appear thus.

Subject: Physiology

First Year MBBS

Sub Item: Practical (Physiology)

1	2	3	4	5	6	7	8
Competency # addressed	Name of Activity	Date dd-mm-yyyy	Attempt at activity First or Only (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations Or Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty and date	Feedback Received Initial of learner
PY6.8-6.10	Respiratory exam in normal	19-09-2019	F	B	R		Yes, Initial

2. AETCOM Competency

1. Competency identified:

a. AETCOM module 1.4 (also included as IM 26.20)

Ability to communicate to patients in a patient, respectful, non-threatening, non-judgmental and empathetic manner

2. Name of activity:

i. Large group session- 2 hours

ii. Self-directed learning with documentation of personal reflection- 2 hours

iii. Small group discussions – 2 hours

iv. Discussion and closure – 1 hour

3. Components of activity:

a. Introductory large group sessions on the principles of communication.

b. Self-directed/Guided learning by students on the importance and techniques of effective communication.

c. Small group sessions on improving communication. These sessions can include either videos or role play highlighting common mistakes in patient - doctor communication and allowing students to identify these mistakes and discussing on how to correct them.

d. Closure session with reflection by students in a small group based on sessions 1, 2 and 3 and with emphasis on learning done and future directions.

4. Criteria for successful completion of activity: Active participation in 3 a, b & c

i. Assessment of reflections by peer groups / mentors

5. **Numerical scoring for activity:** Not required
6. **Documentation of activity in portfolio or Annexure of logbook:**
Required. Document reflection
7. **Recommended action when learner is unsuccessful**
- i. Provide feedback
 - ii. Allow repeat / discuss chance to improve in subsequent sessions.
 - iii. If repeat x 2 is unsuccessful learner must review video available / work with the faculty prior to retaking the activity.
8. **Any other comments**
- Student reflections may be part of the portfolio as a record of the activity done.

Table 6. Sample logbook entry where the student has successfully completed the activity

Subject: AETCOM

MBBS Phase I

1	2	3	4	5	6	7	8
Competency # addressed	Name of Activity	Date dd-mm-yyyy	Attempt at activity First or Only (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty and date	Feedback Received Initial of learner
AETCOM 1.4	Basics of communication (P1)	22-10-2019	F	M	C		

This competency is completed by various activities on a longitudinal basis through various phases and hence it is important that the logbook is maintained/ available through the phases.

3. Documentation of field or clinic visit

Pre-specified activities that are part of the curriculum need to be captured in the logbook. One such example is a community visit or specialised clinic visit.

1. Competencies identified

PE 6.11 Visit to the Adolescent clinic

2. Name of activity

Visit to adolescent clinic

3. Components of activity:

- a. Activity is planned
- b. Learner visits center in small groups
- c. A briefing session is provided
- d. Learner understands organisation, team work, services provided, criteria for referral
- e. Learner observes care provided to adolescents
- f. Learner interacts with team members
- g. A debrief of learning done is provided
- h. Learner writes a summary of observation and reflection

4. Criteria for successful completion of activity

Activity completed and documented in logbook

Summary of observations placed in portfolio or Annexure to logbook

5. Numerical scoring for activity

Not required

6. Documentation of activity in portfolio or Annexure of logbook

Required. Document narrative of visit and learnings

7. Recommended action when learner has not completed the task satisfactorily

- a. N/A

8. Any other comments

Table 7. Sample logbook entry where the student has successfully completed the visit

Subject: Pediatrics

MBBS Phase III (2)

Sub item: Visit to Adolescent Clinic

1	2	3	4	5	6	7	8
Competency # addressed	Name of Activity	Date dd-mm-yyyy	Attempt at activity First or Only (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty and date	Feedback Received Initial of learner
PE 6.11	Visit to Adolescent Clinic	17-09-2019	F	M	C		

Appendix I

Sample Logbook for professional year 1

College Emblem

Name and address of the college:

Personal details

Name of the student:

Date of admission to MBBS Course:

Date of beginning of the current Phase:

Reg. No. (College ID)

Reg. No. (University ID)

Permanent Address:

E mail ID: (optional)

Mobile Number: (optional)

LOGBOOK CERTIFICATE (Sample)

This is to certify that the candidate Mr/ Ms
....., Reg No., admitted in the
year 2019-20 in the ----- Medical College, ----- has
satisfactorily completed / has not completed all assignments /requirements mentioned in
this logbook for first year MBBBS course in the subject(s) of Anatomy/
Physiology/Biochemistry/Foundation Course/ AETCOM during the period from
..... to..... . She / He is / is not eligible to appear for the summative
(University) assessment as on the date given below.

Signature of Faculty

Name and Designation

Countersigned by Head of the Department

Principal/Dean of the College

Place:

Date:

GENERAL INSTRUCTIONS

- 1) The logbook is a record of the academic / co-curricular activities of the designated student, who would be responsible for maintaining his/her logbook.
- 2) The student is responsible for getting the entries in the logbook verified by the Faculty in charge regularly.
- 3) Entries in the logbook will reflect the activities undertaken in the department & have to be scrutinized by the Head of the concerned department.
- 4) The logbook is a record of various activities by the student like:
 - Overall participation & performance
 - Attendance
 - Participation in sessions
 - Record of completion of pre-determined activities.
 - Acquisition of selected competencies
- 5) The logbook is the record of work done by the candidate in that department / specialty and should be verified by the college before submitting the application of the students for the University examination.

INDEX

Sr. No	Description of the course	Page numbers	
		From	To
1	Foundation Course		
2	AETCOM Module		
3	Early Clinical Exposure		
4.	Vertical Integration		
5	Humanities		
6	Subject: Anatomy		
7	Subject: Physiology		
8	Subject: Biochemistry		
9	Extracurricular activities		
10	Sports / Physical Education		

Table 1. Sample of Logbook page in Human Anatomy
Subject: Human Anatomy

First Year MBBS

Sub Item: Dissection / Histology / Museum sessions / Vertical Integration / Early Clinical Exposure /Seminar /Self Directed Learning

1	2	3	4	5	6	7	8
Competency # addressed	Name of Activity	Date completed: dd-mm-yyyy	Attempt at activity First or Only (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty and date	Feedback Received Initial of learner

Separate sheet(s) for Foundation Course, AETCOM, Humanities, Sports, extracurricular activities, subjects (as in the index) needed.

(This table can be replicated in as many pages, as needed)

Table 2. Sample of Logbook page in Biochemistry

Subject: Biochemistry

First Year MBBS

Sub Item: Practicals (Student Lab.) / Practicals(Clinical Lab.) /Vertical Integration /Early Clinical Exposure /Seminar/ Self Directed Learning

1	2	3	4	5	6	7	8
Competency # addressed	Name of Activity	Date completed: dd-mm-yyyy	Attempt at activity First or Only (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty and date	Feedback Received Initial of learner

Separate sheet(s) for Foundation Course, AETCOM, Humanities, Sports, extracurricular activities, subjects (as in the index) needed.

(This table can be replicated in as many pages, as needed)

Table 3. Sample of Logbook page in Physiology

Subject: Physiology

First Year MBBS

Sub Item: Practicals (Student Lab.) / Practicals(Physiology) / Vertical Integration / Early Clinical Exposure / Seminar / Self Directed Learning

1	2	3	4	5	6	7	8
Competency # addressed	Name of Activity	Date completed: dd-mm-yyyy	Attempt at activity First or Only (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) Repeat (R) Exceeds (E) expectations	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty and date	Feedback Received Initial of learner

Separate sheet(s) for Foundation Course, AETCOM, Humanities, Sports, extracurricular activities, subjects (as in the index) needed.

(This table can be replicated in as many pages, as needed)

Final Summary

Sr. No	Description	Dates		Attendance percentage	Status	Signature of Teacher
		From	To		Complete/ Incomplete	
1	Foundation Course					
2	AETCOM Module					
3	Early Clinical Exposure					
4.	Vertical Integration					
5	Humanities					
6	Subject: Human Anatomy					
7	Subject: Physiology					
8	Subject: Biochemistry					
9	Extracurricular activities					
10	Sports /Physical Education					



MGM MEDICAL COLLEGE AND HOSPITAL

Navi Mumbai, Maharashtra