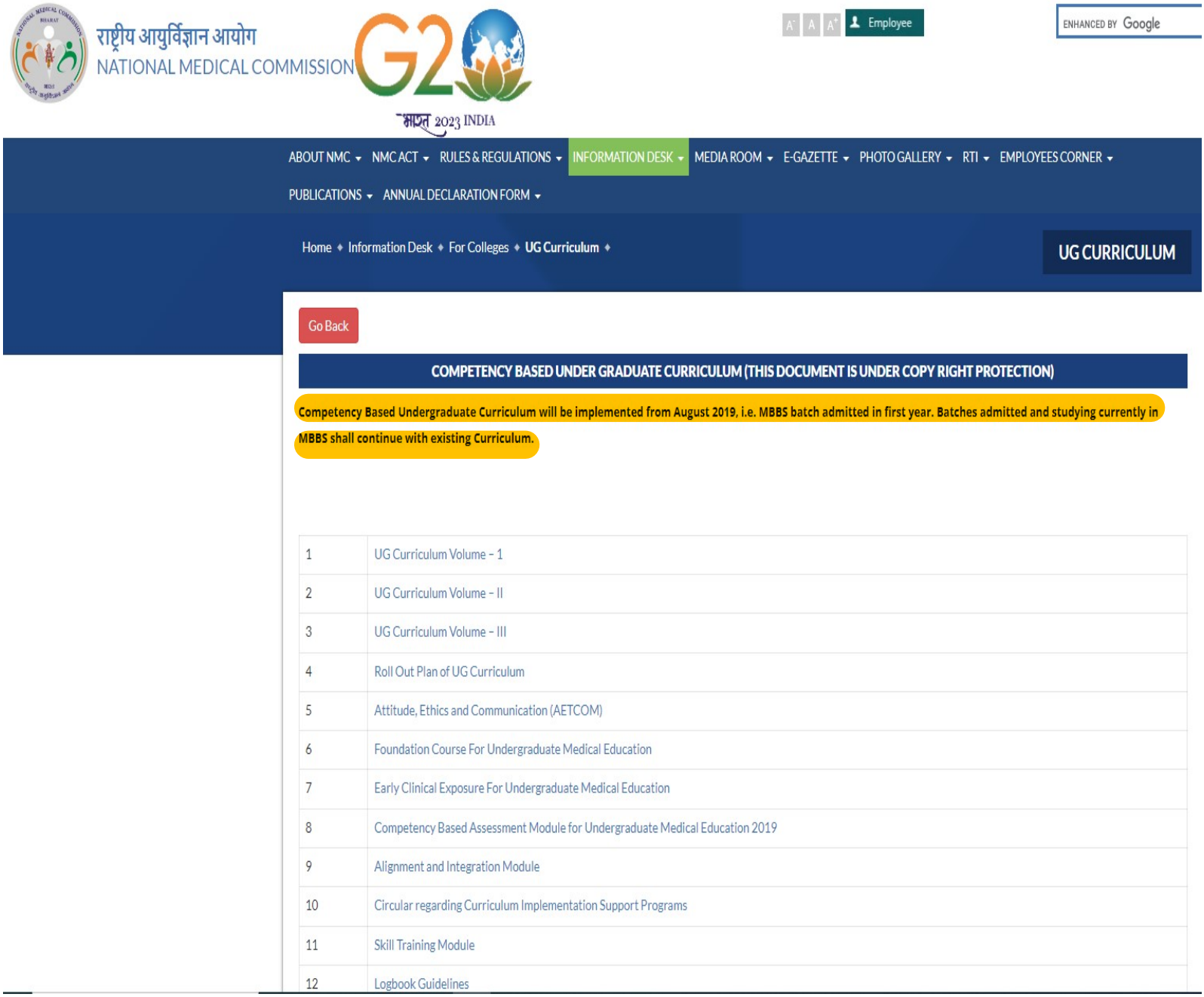
SYLLABUS POST REVISION FOR MBBS

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Supporting Documents for Revised Syllabus of MBBS

Sr. No.	Description	Link to Supporting Documents
1	Revised Syllabus of MBBS – Year 2019	VIEW
2	Revised Syllabus of MBBS – Year 2020	VIEW

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Screen shot of web portal of National Medical Commission indicating revised competency based undergraduate curriculum

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CIRCULAR

No. MCI-Academics/2019/168360 Date:02/12/2019

To,

1. Conveners of MCI Regional and Nodal Centres
2. Dean/Principal of all Medical Colleges.

Subject:- Implementation of Competency Based Curriculum- Part II of the Regulations on Graduate Medical Education, 1997- Reg.

This is to inform all concerned that on 06th November 2019, the Board of Governors in Supersession of Medical Council of India had with the prior approval of Central Government notified in Gazette of India, Part II of the Regulations on Graduate Medical Education, 1997. These Regulations constitute the governing regulations with respect to batches admitted in MBBS course from academic year 2019-20 onwards. A copy of these regulations is available on MCI website under the link E-Gazette. These Regulations give effect to the competency based learning including designing and implementing the new competency based Medical Education curriculum that focuses on the desired and observable ability in real life situations in order to effectively fulfil the roles of Indian Medical Graduate as (a) Leader and member of the health care team and system; (b) Communicator with patients, families, colleagues and community; (c) Life-long learner committed to continuous improvement of skills and knowledge; and (d) professional who is committed to excellence, is ethical, responsive and accountable to patients, community and the profession. The "COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE" is also available on the MCI website.

In order to roll out the curriculum successfully the MCI and its Nodal and Regional centres had conducted "Curriculum Implemen[illegible]port

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Program" (CISP) workshops for sensitizing faculty of Medical Colleges about the competency based UG curriculum. It has come to the notice of this Council that some of the Medical Colleges have not conducted the Curriculum Implementation Support Program (CISP).

Those Medical Colleges that have till date not conducted the CISP program, are hereby directed to coordinate with the Incharge (Convener) of their respective Nodal and Regional Centres and get the program conducted expeditiously for their Medical College Faculty. The observer from Nodal and Regional Centre who will be designated to supervise the conduct of the CISP Program in these Medical Colleges, where CISP is proposed to be held now, will be paid TA/DA and honorarium by the College concerned and an Undertaking from the Dean/Principal of the concerned College has to be given in this regard to the Nodal and Regional Centre for getting the CISP conducted/supervised.

Such workshops are in the interest of the MBBS students and Faculty of the Medical Colleges. The Council shall in due course seek report of participation in CISP from all Medical Colleges.

Sd/-
(Dr. R.K. Vats)
Secretary General

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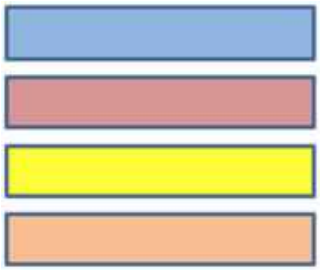
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of Medical Council of India

COMPETENCY BASED UNDERGRADUATE CURRICULUM
FOR THE INDIAN MEDICAL GRADUATE

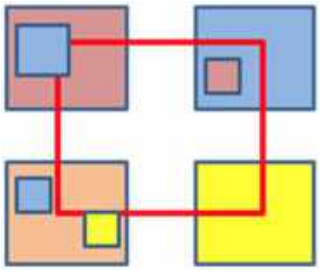
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Describe Observe Demonstrate
Enumerate Assist

Counsel Prescribe

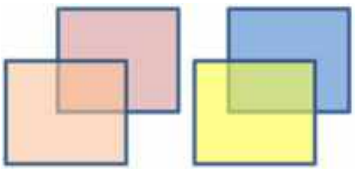


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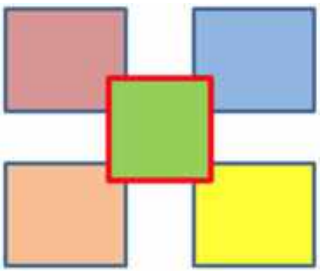


Integrate

Guide Communicate



Correlate



Interpret

Critique Collaborate

Module 4

Alignment and Integration

Clinician Communicator Team Leader Professional Lifelong Learner

Knowledge	Skills	Attitude	Values	Responsiveness	Communication

Curriculum Implementation Support

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Alignment and Integration

Module for

Undergraduate Medical Education

Program

2019

Medical Council of India

Pocket-14, Sector-8, Dwarka,

New Delhi 110 077

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How to cite: Medical Council of India. Alignment and Integration Module for Undergraduate Medical Education Program, 2019: pp 1- 34.

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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

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IN SUPERSESSION OF MEDICAL COUNCIL OF INDIA

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.

Vats

(Dr. R.K. Vats)
Secretary General

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9. **Dr. M Rajalakshmi**
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Curriculum Implementation Support Program

Module – 4

ALIGNMENT AND INTEGRATION

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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 inter-connected 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.

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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.

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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).

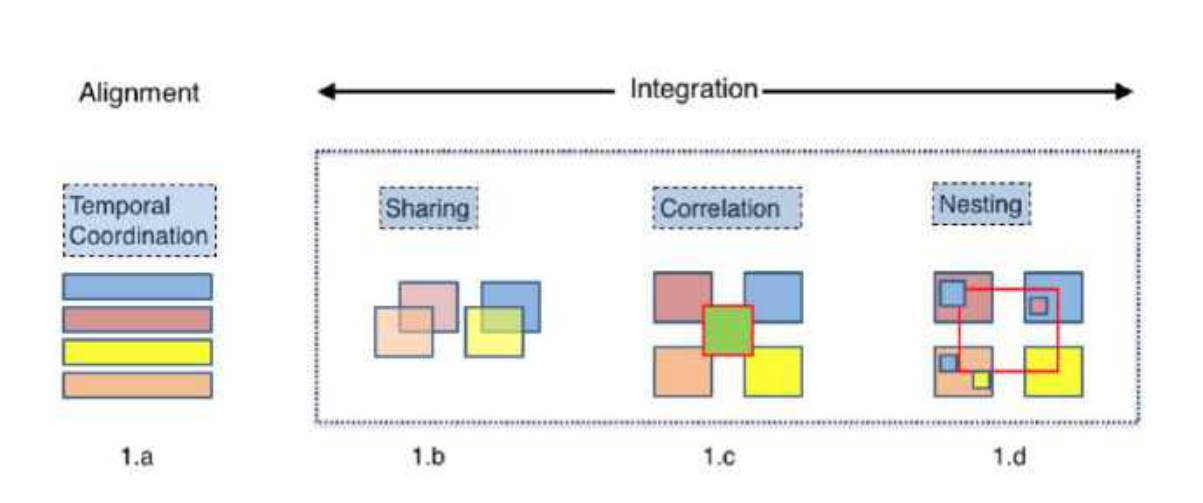


Figure 1: Integration concepts framed in the GMER 2019. Coloured boxes represent subjects. **1a. Alignment** - Temporal coordination: The timetable is adjusted so that topics within the subjects or disciplines which are related, are scheduled at the same time. **1b. Sharing**: Two disciplines may agree 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

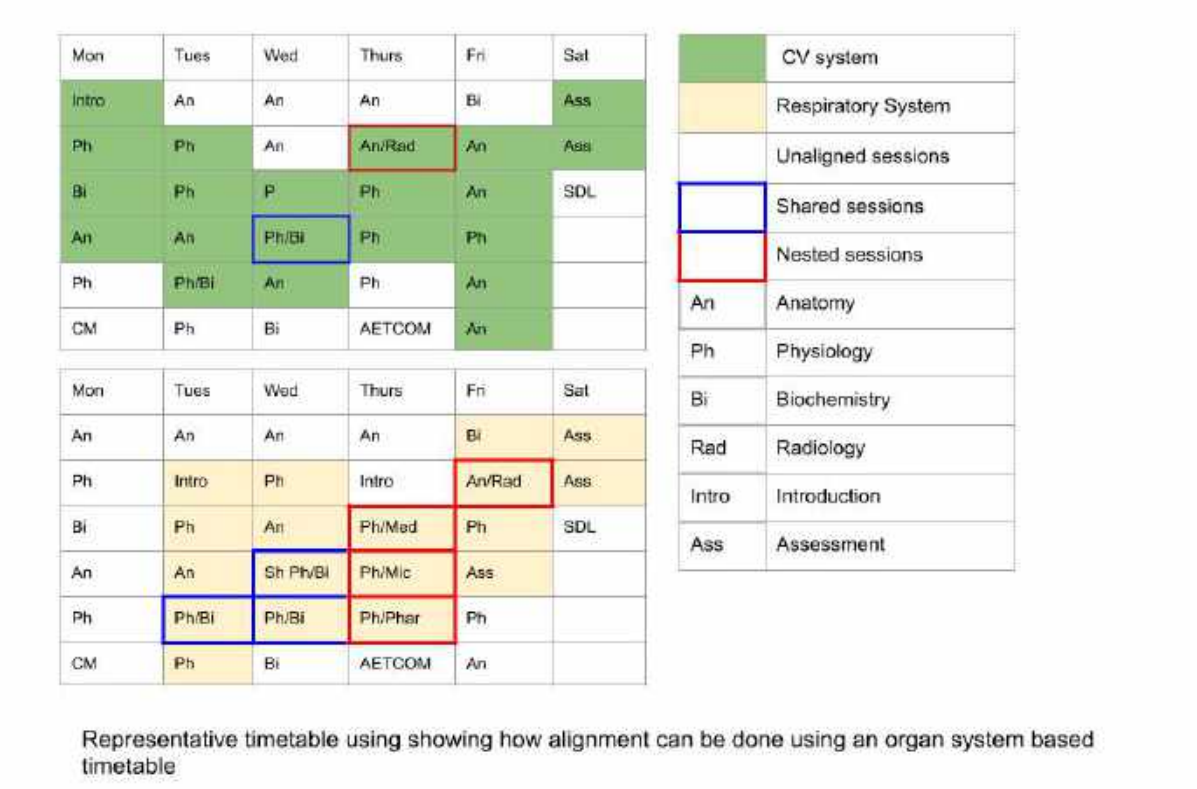
If desired, the major alignment can be organ system based with incorporation of some specific topics that will lend itself to integration (see below).

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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)

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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

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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 it 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).

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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

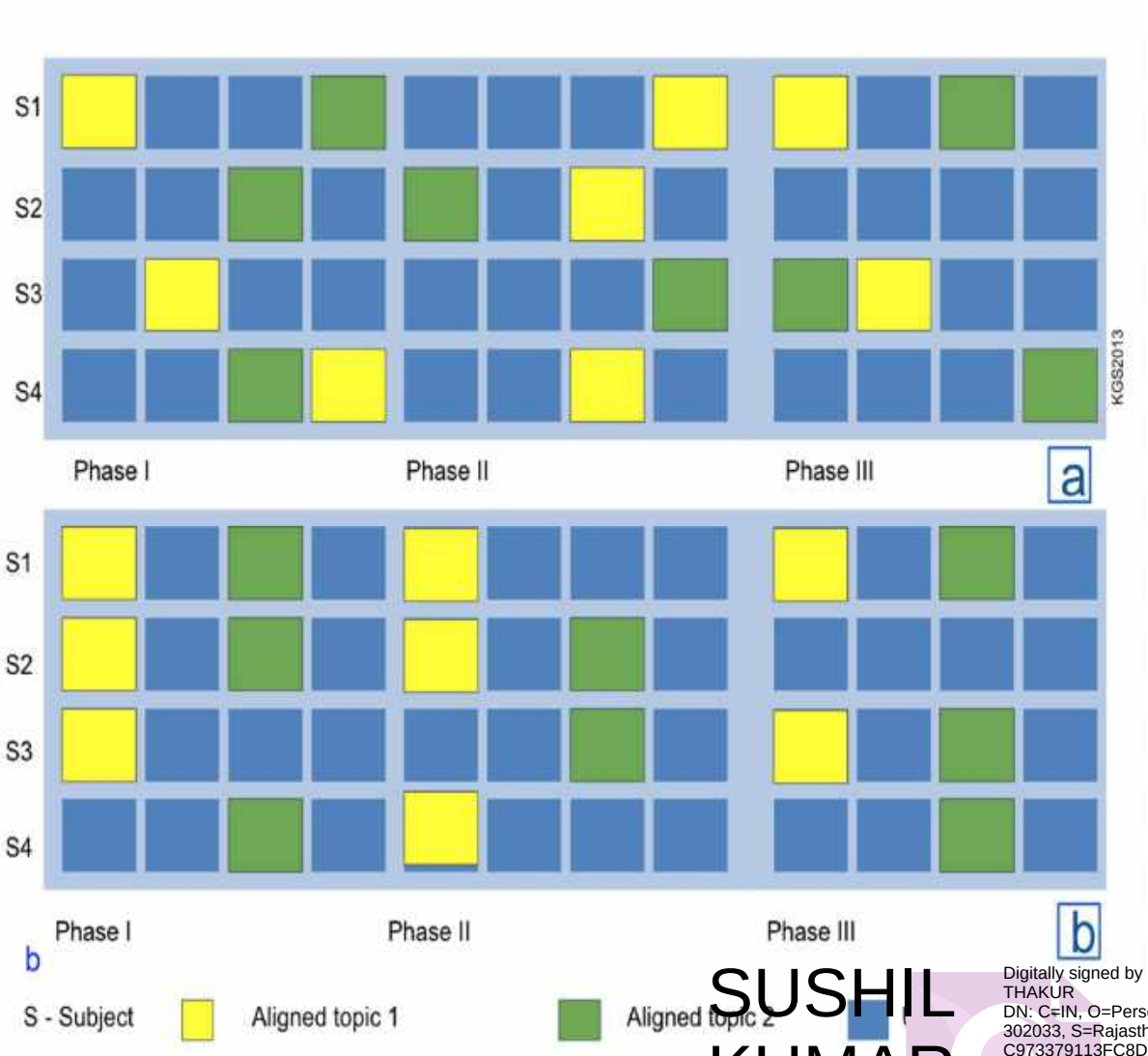
Competency /Objective	Same Phase	Different Phase
Cannot be aligned with a similar topic in a different subject eg. Lower limb anatomy and dissection	Teach separately	-
Can be taught together in different sessions in the same topic eg. Beta Cell histology in anatomy, Beta Cell function in physiology and 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

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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.



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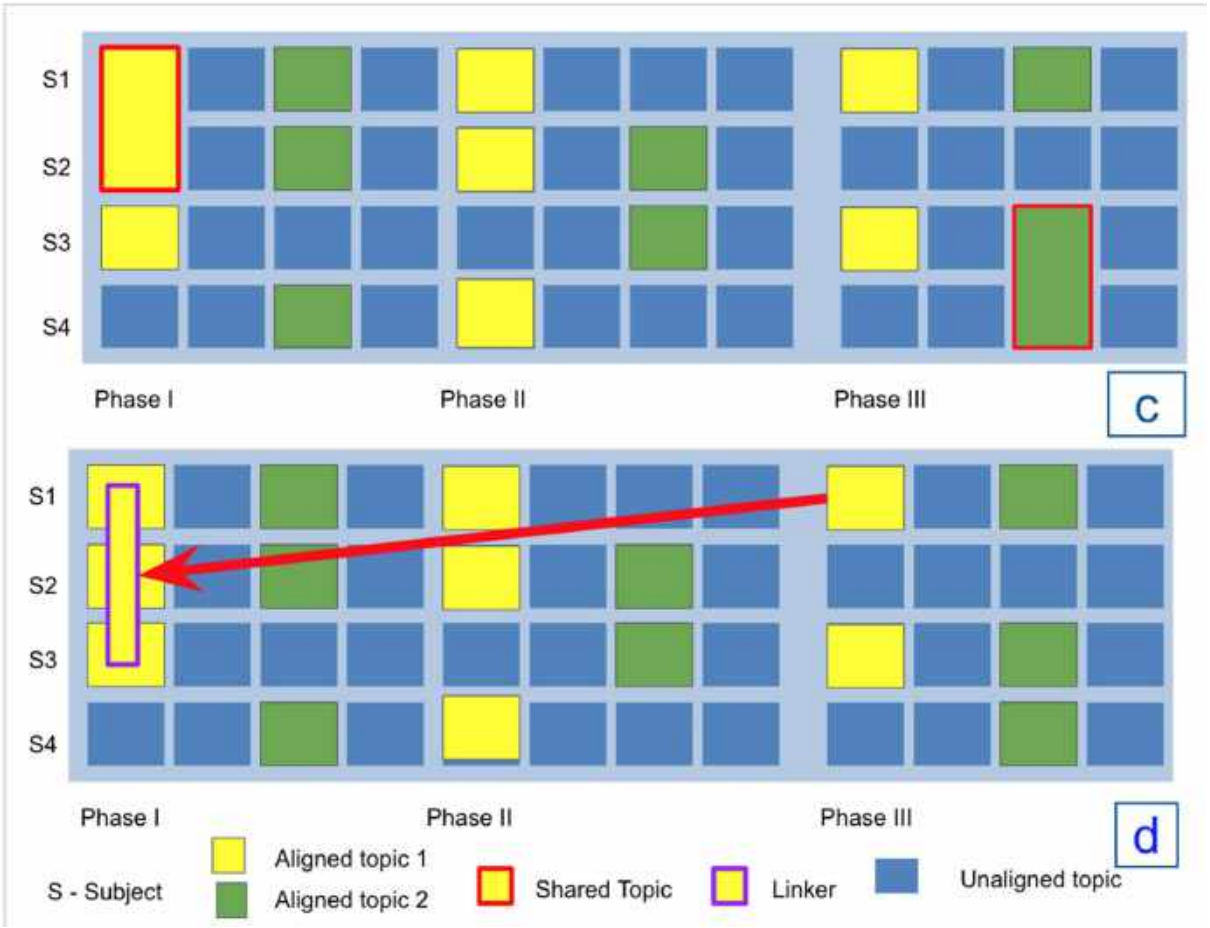


Figure 3c: Redundancy can be reduced by creating a session, merging session objectives from two or more subjects and creating a shared session (Box with red outline).

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.

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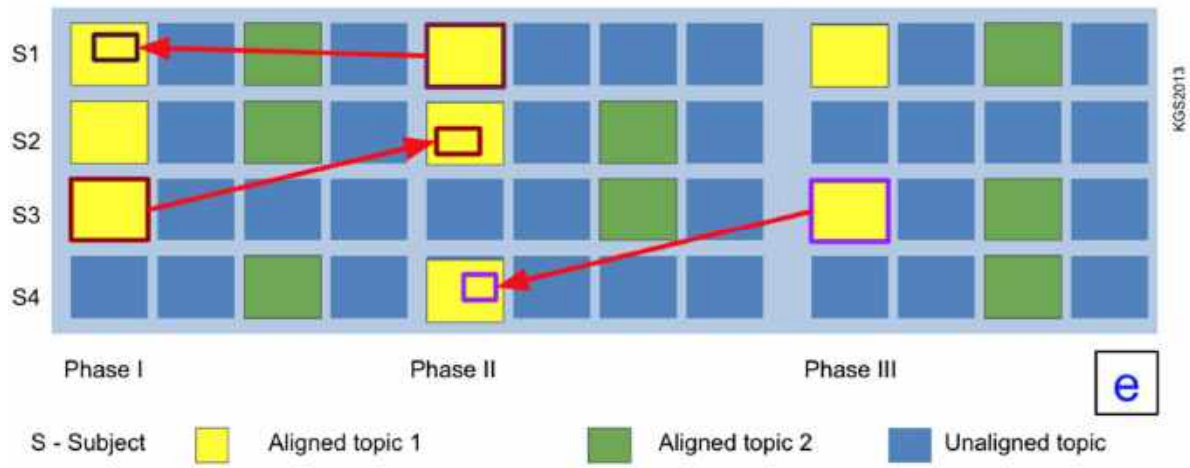


Figure 3e: Appropriate concepts from other phases can be brought into a phase: to increase relevance at a lower phase or increase prior recall or reinforce the fundamental basis at a higher phase. This is done by nesting some learning objectives from the topic in other phases into a learning session.

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Steps in the development of Aligned and Integrated Topic (AITo) (Figure 4)

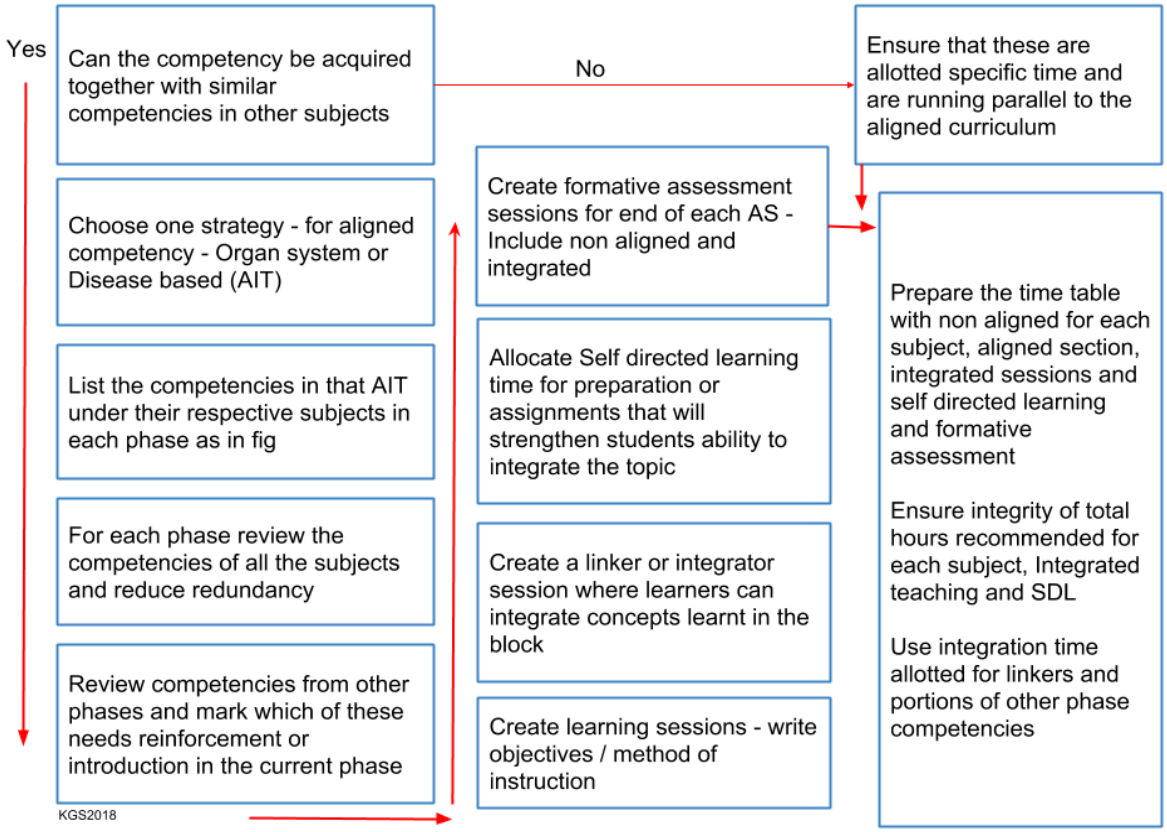


Figure 4: Overview of process to create an aligned and integrated topic

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.

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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 **linke**r 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.

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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.

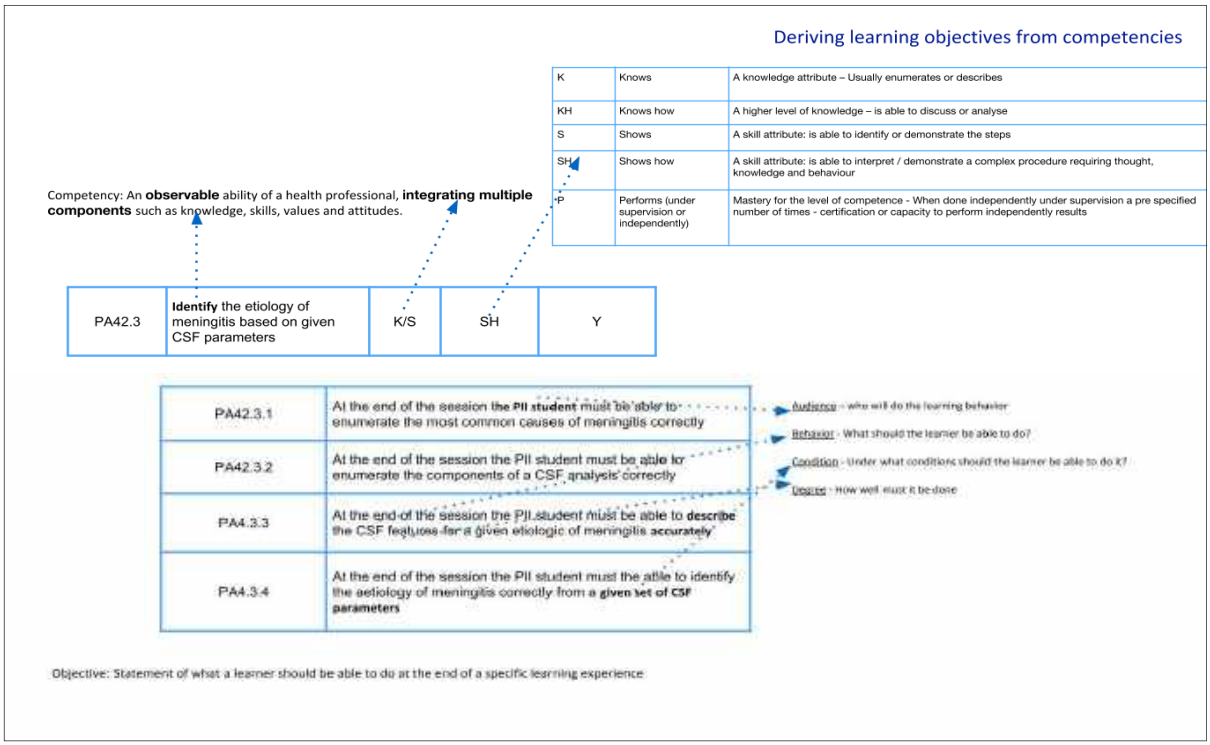


Figure 5 - Deriving learning objectives from competencies

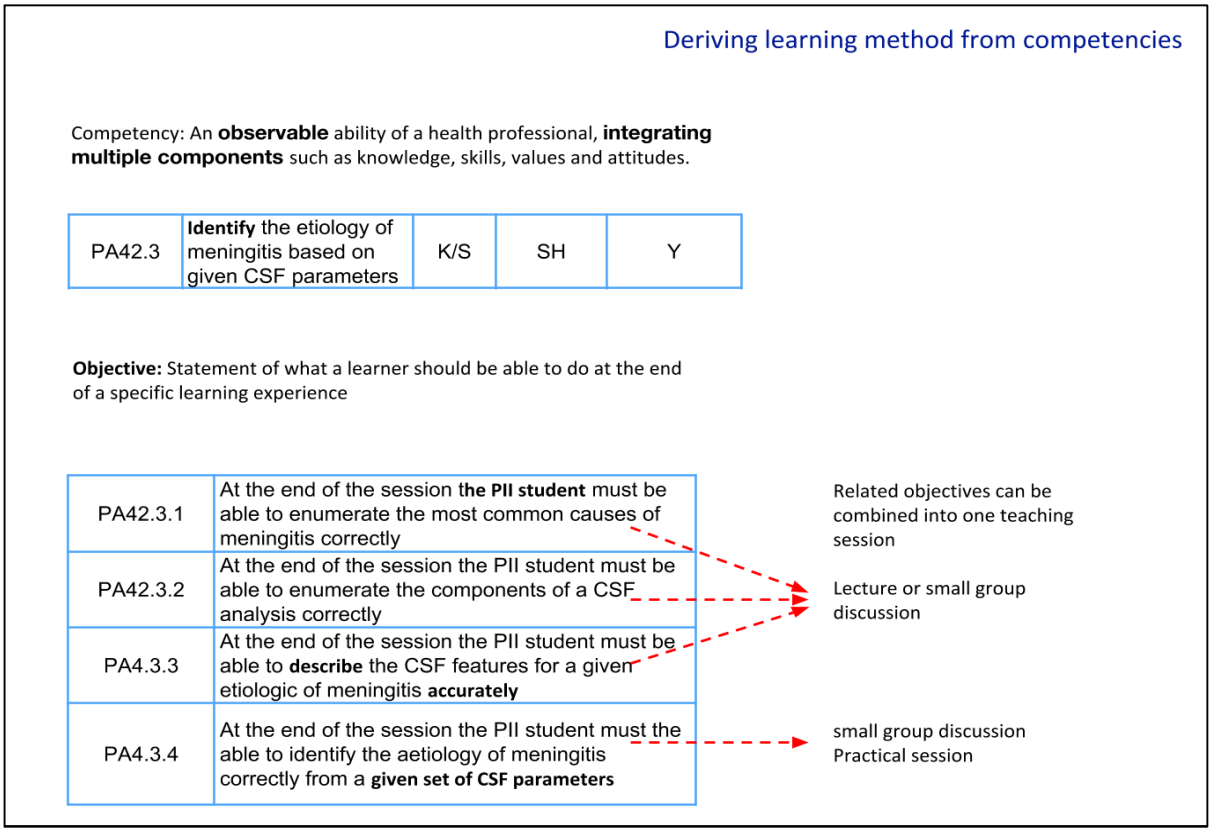


Figure 6. Deriving learning methods from competencies

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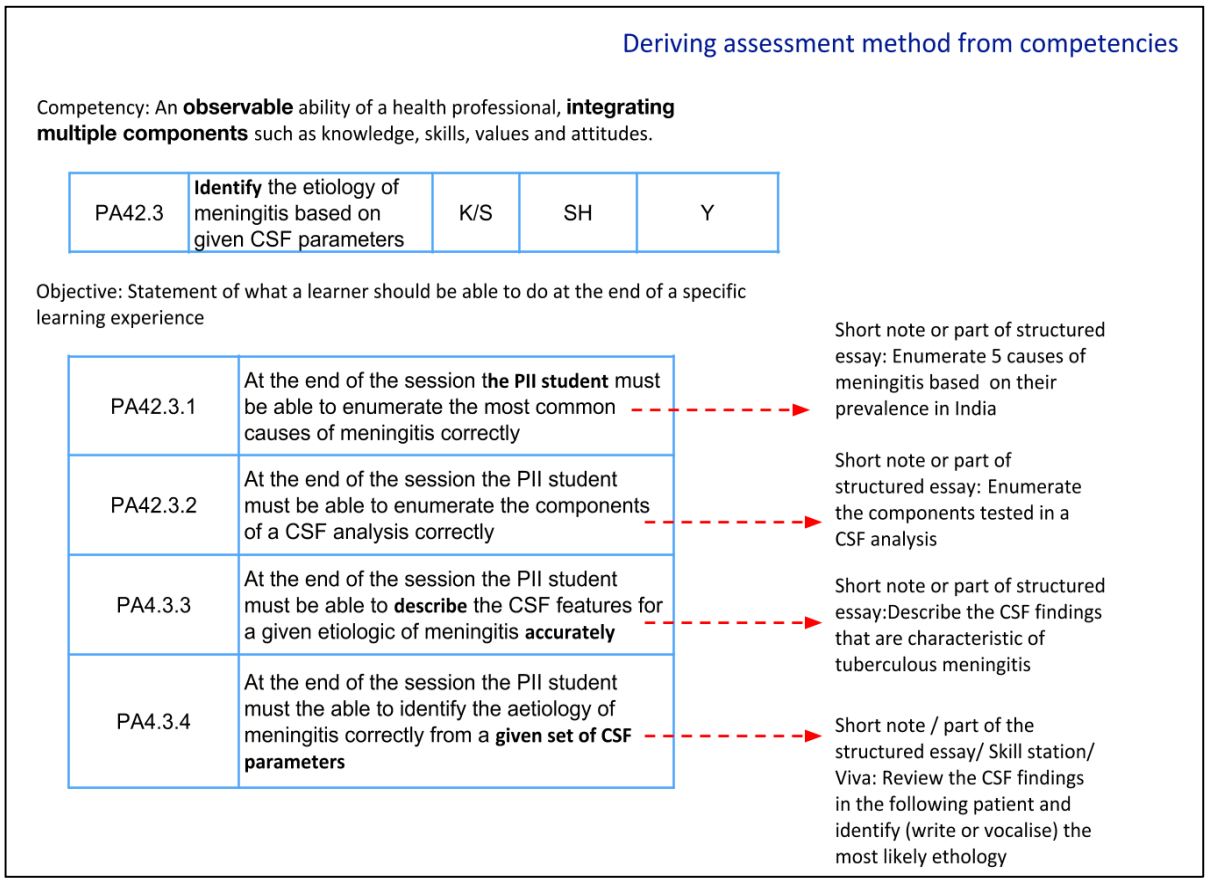


Figure 7: Deriving assessment methods from competencies

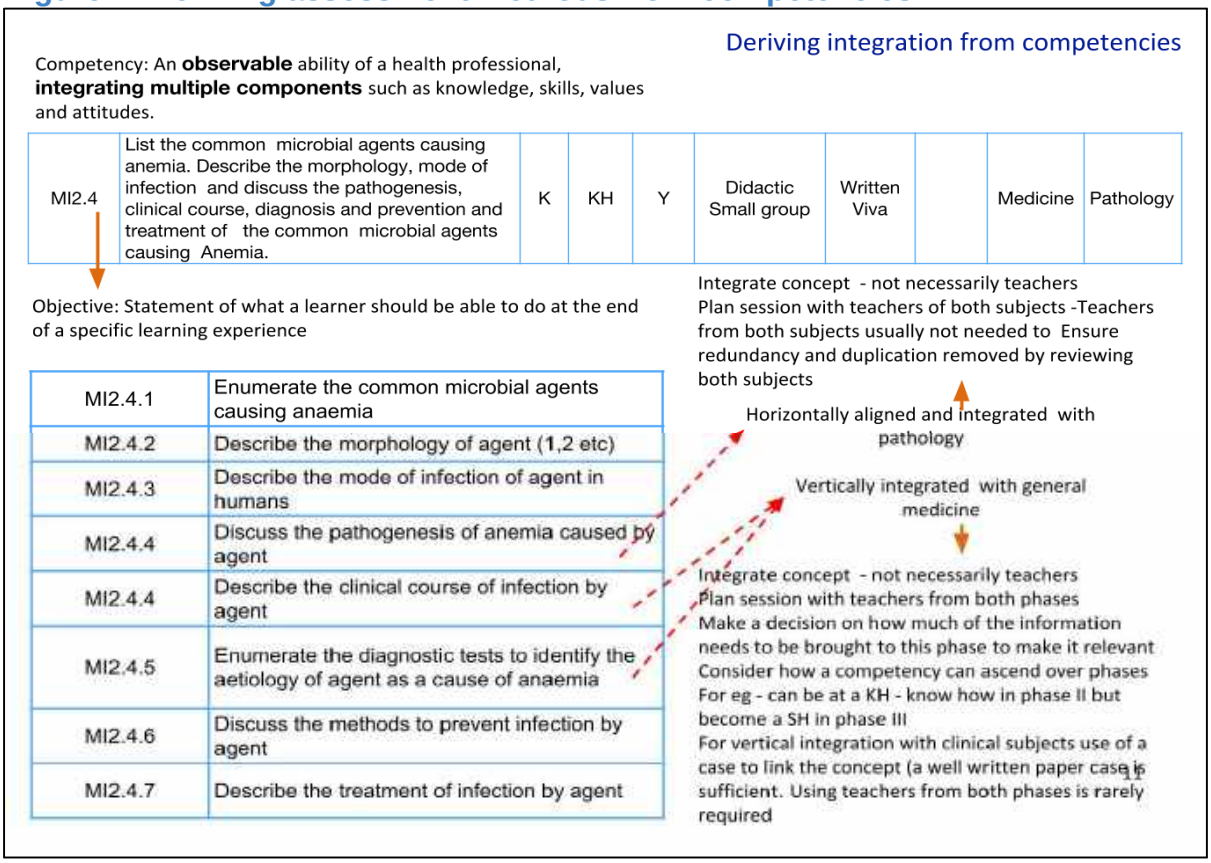


Figure 8: Marking objectives/ competencies for integration

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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

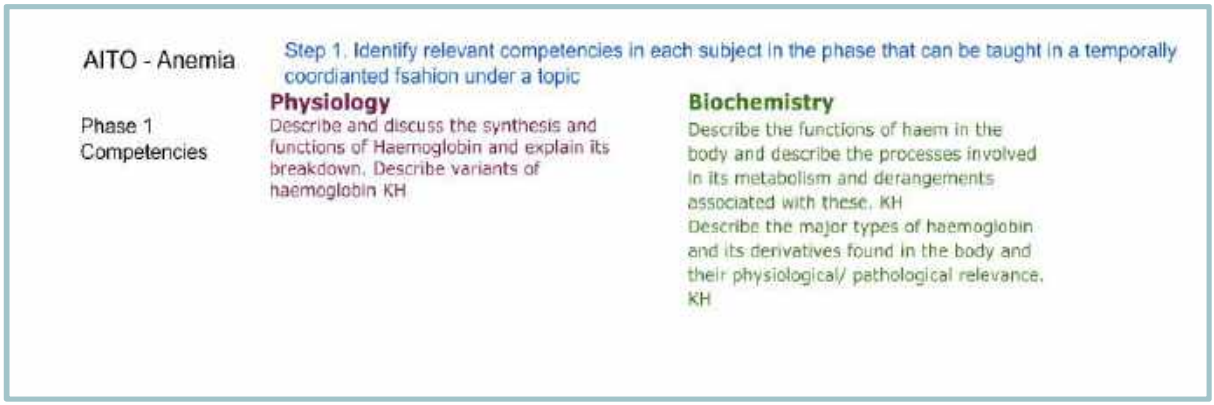


Figure 9.1 In this example two related competencies are identified from physiology (purple) and Biochemistry (Green) from the competency booklet

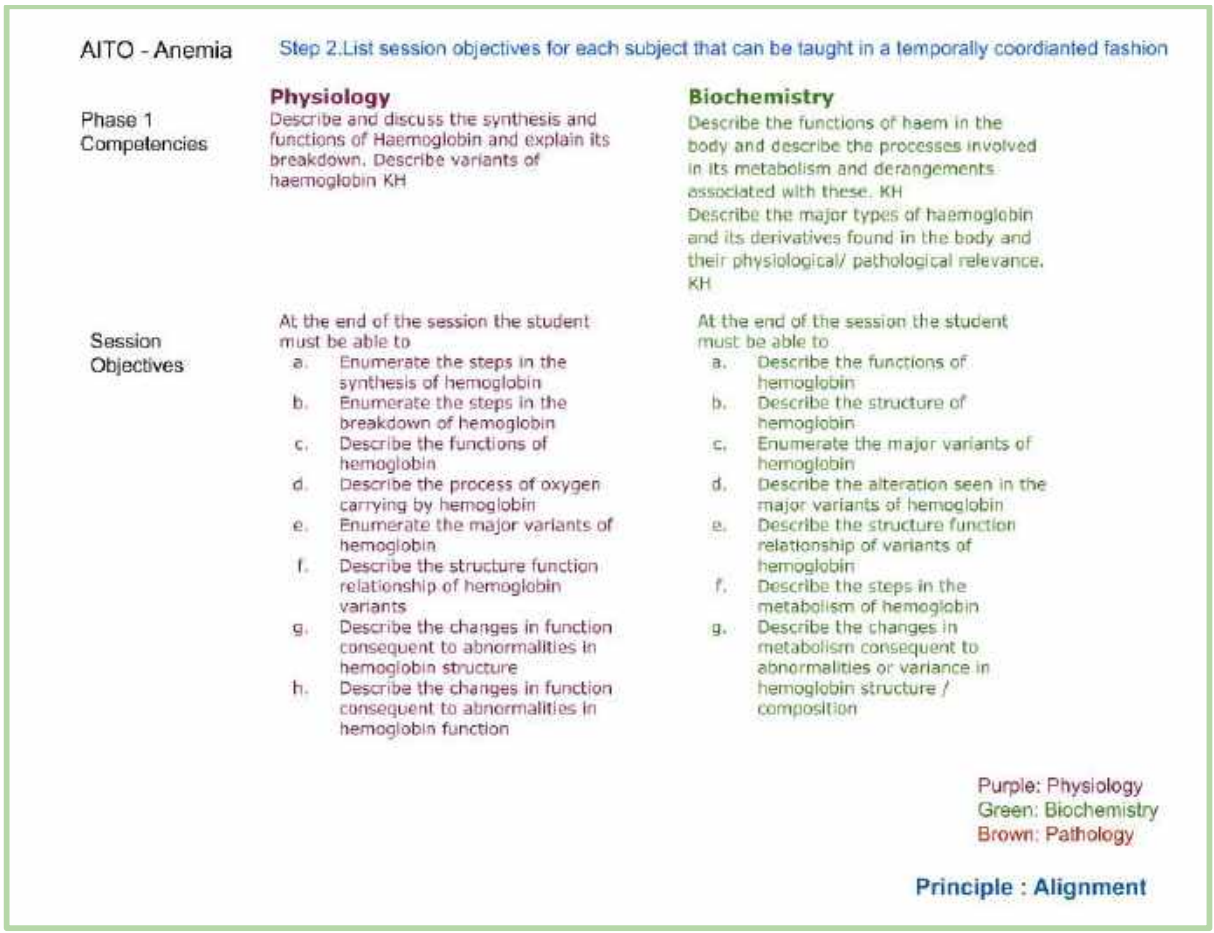


Fig 9.2 Session objectives are derived for each competency are then

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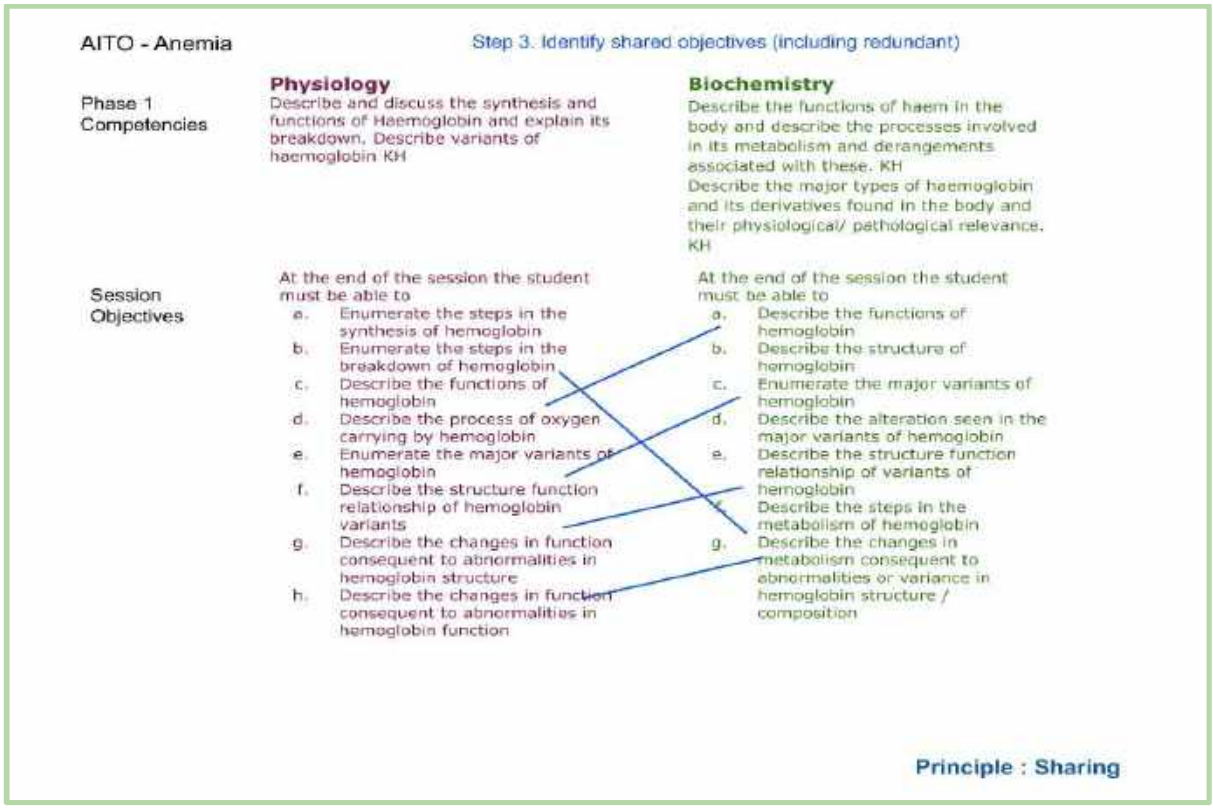


Fig 9.3 Objectives that are similar to both subjects are marked for redundancy and sharing

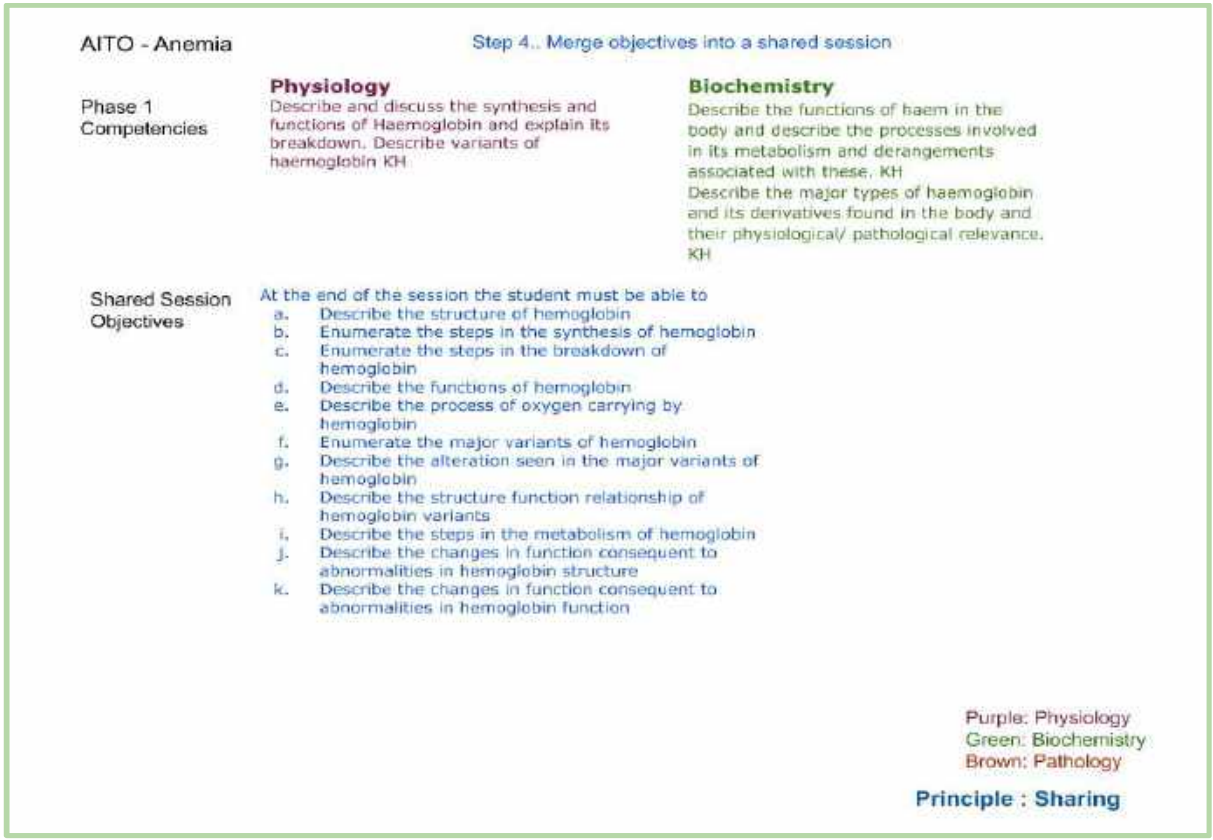


Fig 9.4 A new shared session is created merging the objectives from both subjects by removing redundancy

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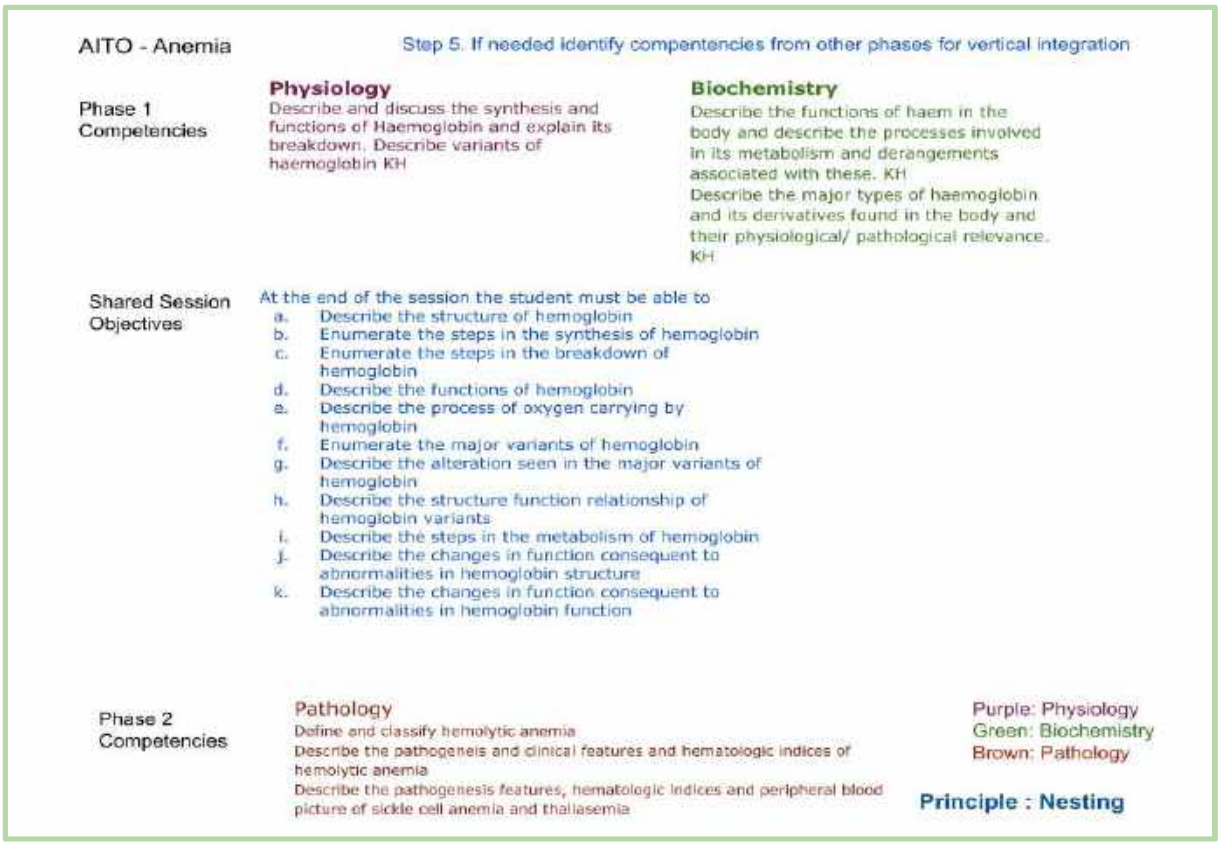


Fig 9.5 If desired, subjects from other phases are reviewed for competencies that will enhance the value of the learning session - in this instance a few competencies from pathology are brought into phase I to enhance the value of learning in the shared session.

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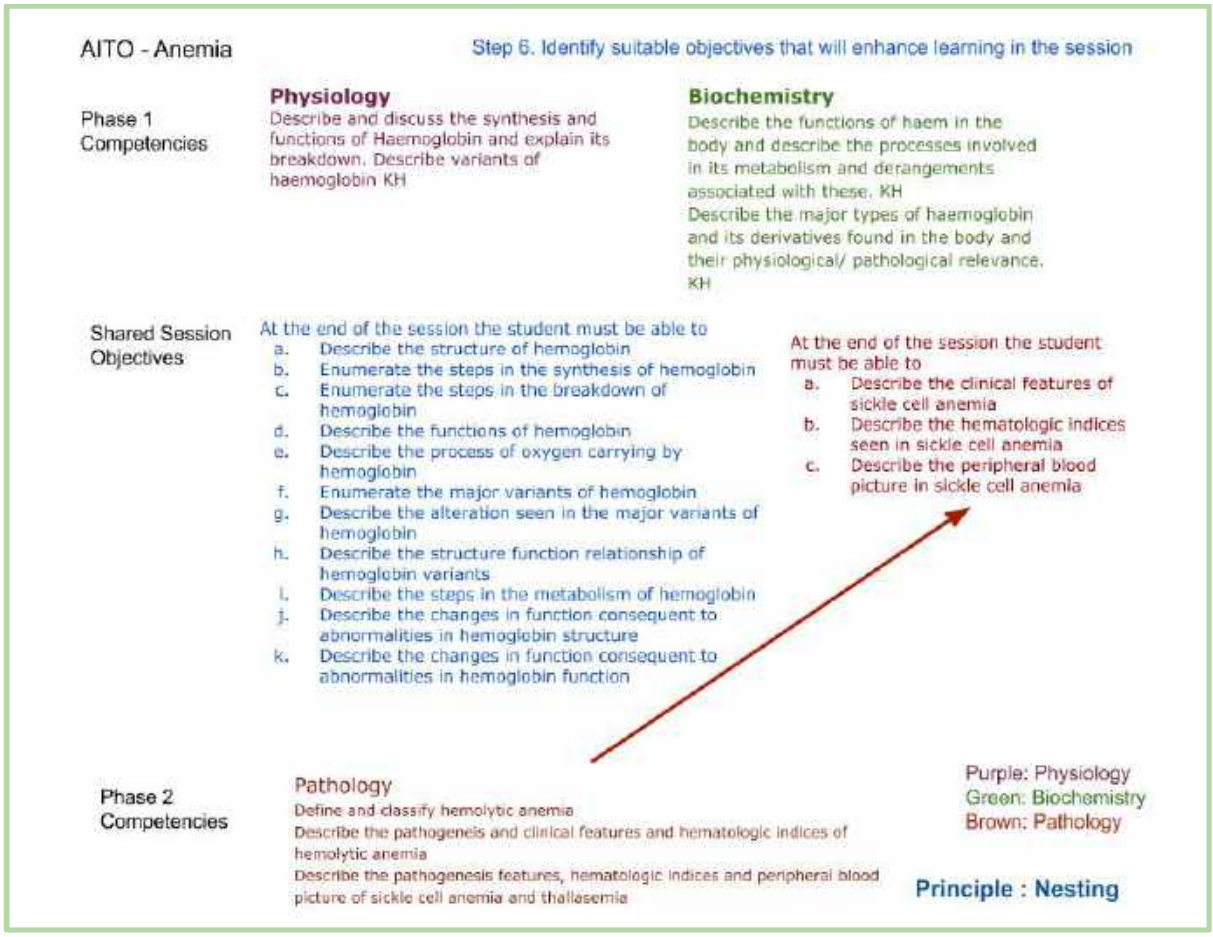


Fig 9.6 Objectives from the pathology (brown) competencies are listed

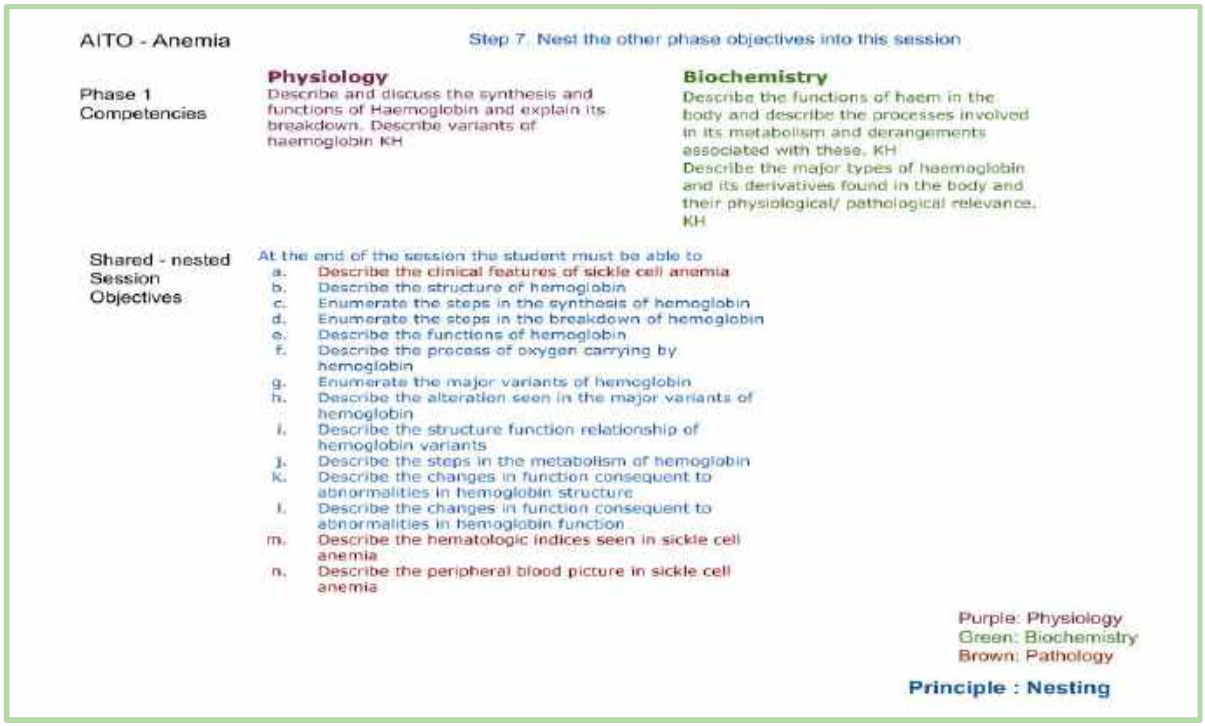


Fig 9.7: Selected objectives are “nested” to the shared session

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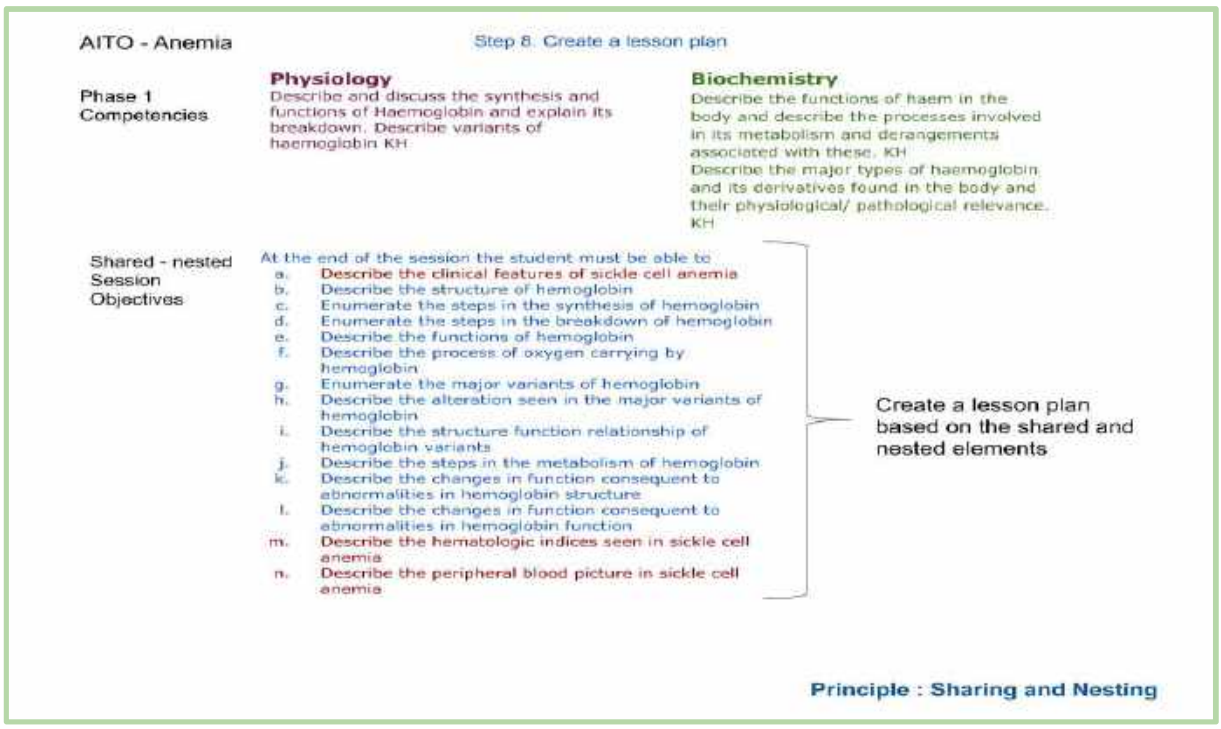


Fig 9.8 A lesson plan is created for the integrated session

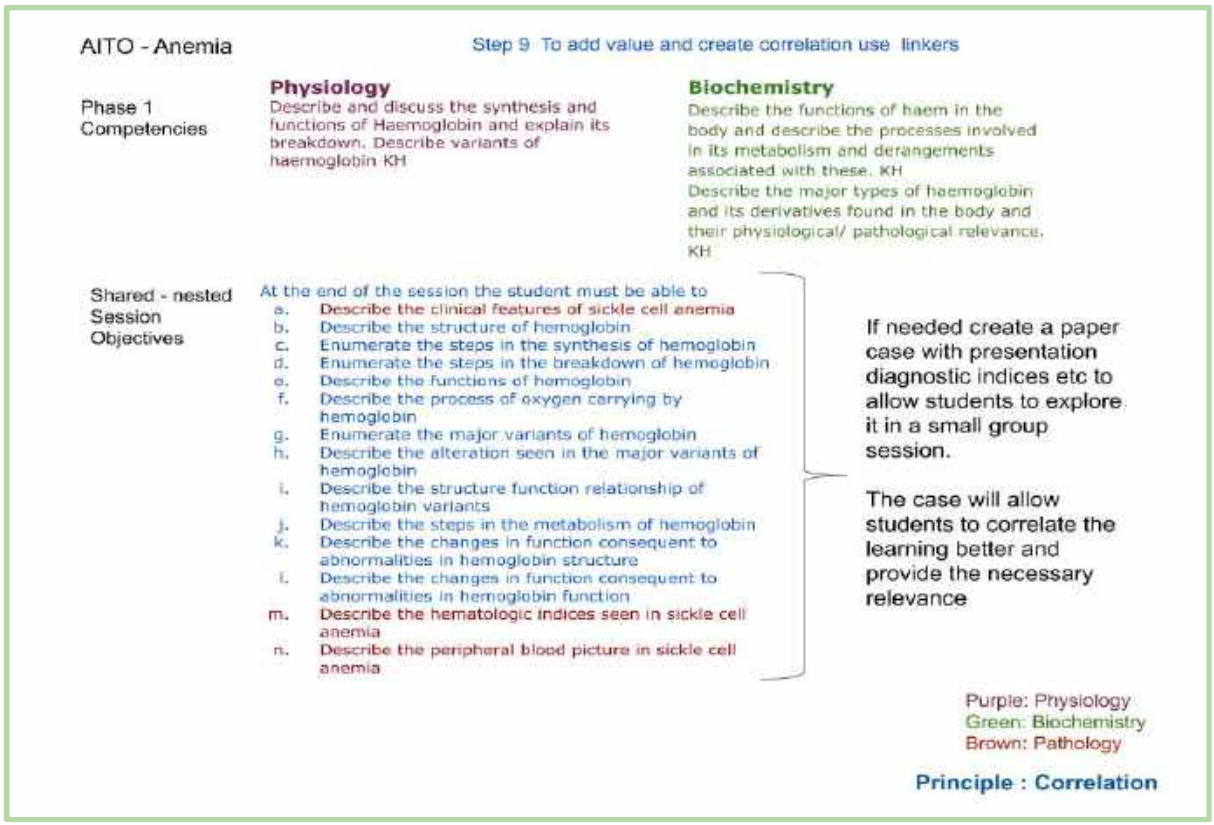


Fig 9.9 A paper case is often used as a linker to improve the relevance and allow greater correlation

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Curricular Governance required to create and implement an Aligned and Integrated Curriculum

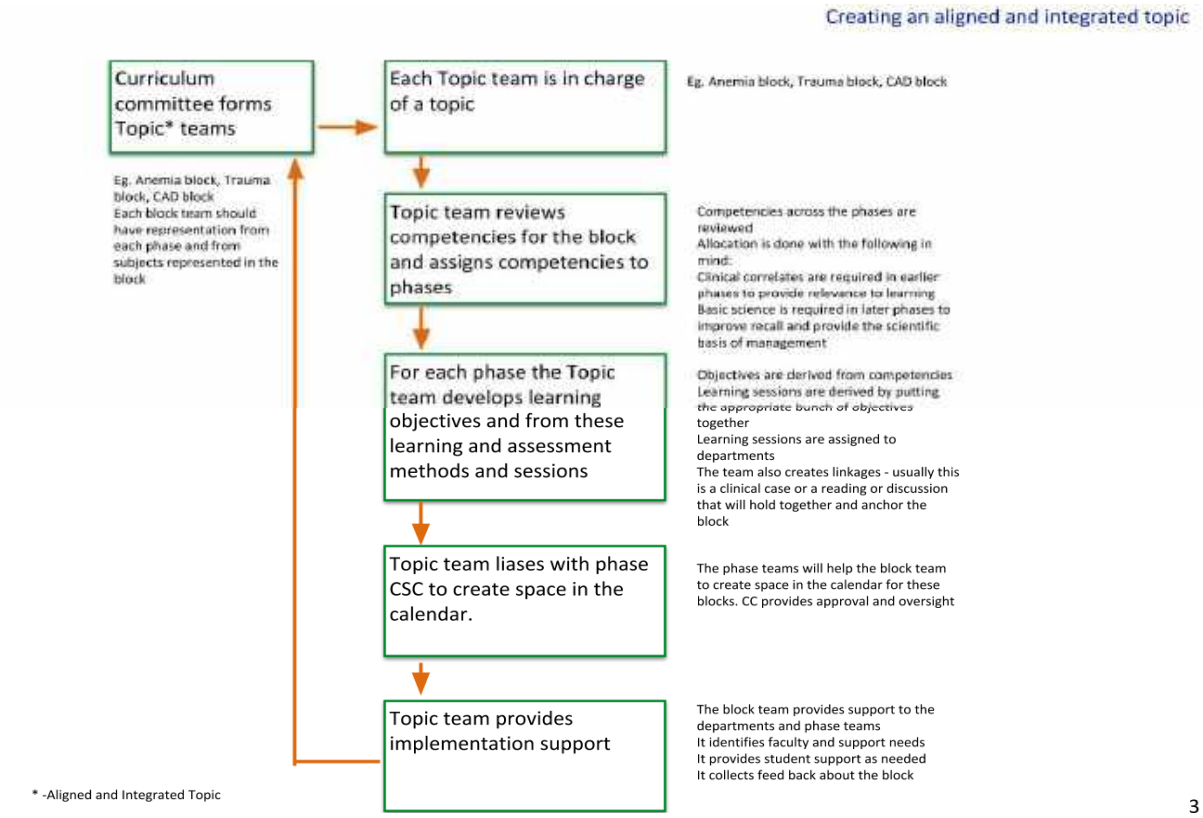


Figure 10: Steps and oversight required in development of Aligned and Integrated Topic

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 (PWCSC) 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,

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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.

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Further reading

Required Reading

1. Ronald M Harden, The integration ladder: a tool for curriculum planning and evaluation, Medical Education 2000;34:551-557.
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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

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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

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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		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 the level of competency required based on the miller's pyramid
K - Knows
KH- Knows How
S - Skill
SH - Show How
P - Perform independently

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

Identifies the suggested learning method.
DOAP -
Demonstrate (by student) **O**bserve **A**ssist **P**erform

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

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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*	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	BI5.2	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	BI6.11	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	BI6.12	Describe the major types of haemoglobin and its derivatives found in the body and their physiological/ pathological relevance.		
2		**Pathology**		**Pharmacology**		**Microbiology**
	PA13.1	Describe hematopoiesis and extramedullary hematopoiesis	PH1.35	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	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.

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	PA13.2	Describe the role of anticoagulants in hematology		
	PA13.3	Define and classify anemia		
	PA13.4	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	PE13.1	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	PE13.2	Describe the causes, diagnosis and management of Fe deficiency
	IM9.4	describe and discuss the genetic basis of some forms of anemia	PE13.3	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	PE13.4	Interpret hemogram and Iron Panel

* List of competencies only representative, not complete.

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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 11-12.00	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, PY 2.1, 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	PY 2.3 BI 6.11BI 6.12 Assignment 2 on Haem synthesis and metabolism		

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COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE

Knows Knows how Shows Shows how Performs

Observe

Demonstrate

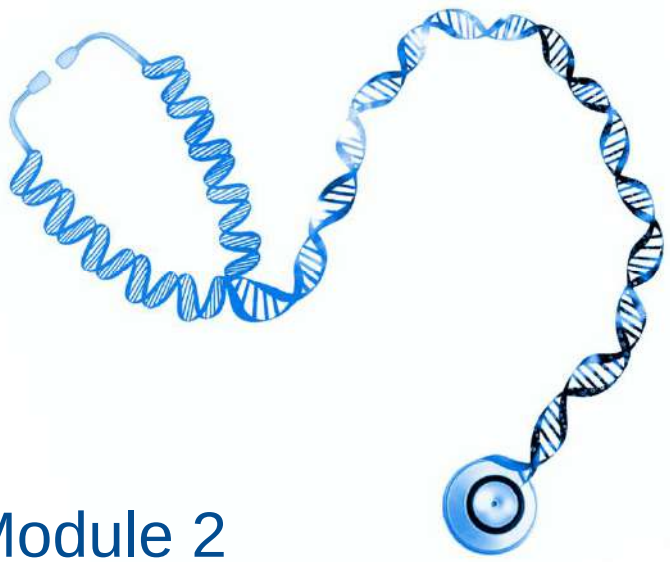
Enumerate

Assist

Counsel

Describe

Prescribe



Analyse

Integrate

Guide

Communicate

Correlate

Interpret

Module 2

Critique

Early Clinical Exposure

Collaborate

Clinician Communicator Team Leader Professional Lifelong Learner

Knowledge | Skills | Attitude | Values | Responsiveness | Communication

Curriculum Implementation Support

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Early Clinical Exposure for

Undergraduate Medical Education

Program

2019

Medical Council of India
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How to cite: Medical Council of India. Early Clinical Exposure for the Undergraduate Medical Education Training Program, 2019: pp 1-43.

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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.

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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 cession 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.

Secretary General

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Curriculum Implementation Support Program

Module – 2

EARLY CLINICAL EXPOSURE

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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 ECEin 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

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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 centricity. 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.

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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.

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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

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- 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.

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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

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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

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Additional reading

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Annexure I

Examples of clinical context and related learning outcome

Clinical Context	Outcome
Parkinson's disease (Neurophysiology) *Patient/video/simulated patient/role play*	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
COPD (Respiratory Physiology) ***Patient/video/investigations***	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
Ascites (Abdominal system) *Patient/video/USG*	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

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Claw hand, Foot drop, Carpal tunnel syndrome (Peripheral nerve injuries) Patient/ video	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
Clinical Context	**Outcome**
Varicose veins (Venous drainage of the lower limbs) *patient/video*	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
Type 2 Diabetes mellitus (T2DM) (Nutrition & Biochemical Lab tests) *patient/ Lab investigations*	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
Obesity (Nutrition) *Video/Clinical parameters*	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.

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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, hirsuitism, striae, buffalo hump

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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

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- 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?*

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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?

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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.

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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

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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.

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- 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

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this patient encounter in the OPD is to be written down by the student and reviewed by teacher-in-charge of ECE.

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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.

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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

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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'

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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 forimprovements 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.

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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

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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)

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- 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.

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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

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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'

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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 forimprovements 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

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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

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4. Summary & Conclusion 15 mins
5. Assignment 30 mins

ECE Classroom setting: Objectives1-3can 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	Na^+ 134 meq/L
HCO_3^-: 15meq/L	K^+: 4.2meq/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.*

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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

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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 healthand 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

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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

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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 B_{12}injections.

Q. Explain the physiological basis of:

a. Need of Vit B_{12} 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.

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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.

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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

Foundation Course

Critique

Collaborate

Clinician | Communicator | Team Leader | Professional | Lifelong Learner

Knowledge | Skills | Attitude | Values | Responsiveness | Communication

Curriculum Implementation Support

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Foundation Course for the Undergraduate Medical Education Program

2019

Medical Council of India
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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.

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डॉ. राकेश कुमार वत्स
महासचिव
Dr. R.K. Vats
Secretary General

सत्यमेव जयते

भारतीय आयुर्विज्ञान परिषद
के अधिक्रमण में शासी बोर्ड
पॉकेट – 14, सेक्टर – 8 द्वारका फेस– 1
नई दिल्ली–110 077
BOARD OF GOVERNORS
IN SUPERSESSION OF
MEDICAL COUNCIL OF INDIA
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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 programwhich 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.

Secretary General

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Curriculum Implementation Support Program

Module – 1

FOUNDATION COURSE

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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.

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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.

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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

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(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.

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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

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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 9.1.1of 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 precinct.

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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.

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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

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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

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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

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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.

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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				

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Sample lesson plans

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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

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- 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	▪ 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 Cou

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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

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

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Methodology

No	Sub session	Methods	Requirements	Time
1	**Introduction**	Moderators, observers and other participants		10 minutes
2	Role of doctors buzz groups	• 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 The discussion that follows will be based on the	10 cards per group i.e. 150 cards Felt pens 04 large black poster sheets A4 white paper – for notes and observations	30 minutes

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		nature of responses: • 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	**Short film: In Silence – maternal mortality in India** Discussion: • 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?	LCD projector with adequate sound facilities	30 minutes

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		that they can exploit for greater common good?		
4	Meet the doctor	**Meet the doctor:** Three doctors with diverse backgrounds who have chosen wider roles in society: They introduce themselves and their work **Interview them:** • 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	6o minutes
5	Wrap up	Wrap up: Each student gets one card. • Think of one social issue in your own local area. • What could you do to help address that issue?	150 cards 4 black poster sheets 60 brief feedback questionnaires	30 minutes

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		Students stick it on a poster entitled – • 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	An interactive lecture to discuss • the roles of a physician and the expectation from the patient, families and society. followed by small group discussion Videos / clippings relating to the roles of the doctor could also be used as a trigger for discussion	LCD projector, audio output for video, Appropriate Video clips, Flip charts, Marker pens	1 hour
2	Shadowing the physician	Students asked to shadow Physicians and • observe patient- physician interaction and their expectations from doctors		2 hours
3	Reflection	Small group discussion and reflection		2 hours
4	Wrap up	Summarize salient points		10 minutes

Assessment: Formative: May be assessed by active discussion in the small group session or by Reflective writing in log book.

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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

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 • obtaining information on one important aspect of the History of Medicine (example – evo	History of Medicine hand outs	3 hours

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		theory of medicine, discovery of vaccines,…etc) Small group discussion and reflection Presentation by groups and discussion		
3	Alternate systems of Medicine	lecture/ interactive discussion to address the following questions • 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

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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

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Methodology

No	Sub Session	Methods	Requirements	Time
1	GMR 2019	Lecture/ interactive discussion about the salient features of the GMR 2019 • 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 • 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

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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: ▪ Caring ▪ Clinical Competence ▪ Cost-effectiveness ▪ Continuity of care ▪ Comprehensive care ▪ Common problems management e	LCD projector, Flip charts, Marker pens Case vignette or a visit to a family practitioner	1 hour

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		▪ Co-ordination of Care ▪ Community based care and research ▪ Counselling and Communication skills ▪ Continuing Medical Education (CME) Depending on available time the session may be preceded by either an appropriate case vignette or a visit to a family practitioner		

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

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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.

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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	15 groups of 5 students each = 75 Total 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. • 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. These skills will be taught for both adults and children (including infants)	Space/Area to accommodate 75 students, Adult, child and infant Basic Life support mannequins. LCD projector with adequate sound facilities to show appropriate videos.	2.5 hours (150 minutes)
3	Wrap up	Feedback from students and guidi		15 minutes

Future learning
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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.	75 students: Table top discussion Initial videos to demonstrate emergency scenarios followed by appropriate first aid. • 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) Emphasis on Do's and Don'ts in each category.	Space/Area to accommodate75 students, adult, child and infant Basic Life support mannequins. LCD projector with adequate sound facilities to show appropriate videos.	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 formal

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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

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Methodology

No	Sub Session	Methods	Requirements	Time
1	Definition of Universal Precautions (UP)	Interactive lecture about: ▪ 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	▪ Divide the students into groups of not more than 10 per group. There should be one faculty per group who will conduct an interactive practical demo about ▪ Use of hand rub ▪ Gloving and de-gloving The students will be then allowed to demonstrate the correct method and receive feedback		2 hour
3	Wrap up	Summation and learning points		10 minutes

Assessment: Formative assessment, OSCE

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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

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: ▪ 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

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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

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: • 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

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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

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

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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

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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: A) Levels of health care in a community setting B) Interaction with families in the community setting and the impact of health C) Functioning of the Community Health Centre and health care team Community visit followed by a discussion back in the college	Logistics for community visit	4 hours
4	Principles of community health			
5	Community Health Center			

Assessment: Formative: Reflection writing / discussion of the experi

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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

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**.**	• 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 in	Logistics for community visit LCD projector, Flip charts, Marker pens	1 hour (The time for community visit is factored in in the previous session)

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		health and illnesses • The environmental health problems in the community • Patient experiences to diseases treatment-seeking practice • Community visit followed by a discussion back in the college		

Assessment: Formative: Reflective writing of their observations

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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

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	• 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	• Group work using case vignettes / video • Group presentation and discussion with reference to consequences of unprofessional and unethical behavior		1 hour

Assessment: Formative assessment

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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

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

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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

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	• Guest lecture / Address by the dean or director • Case based interactive lecture	LCD projector, Flip charts, Marker pens	1hour
2	Case discussion	• The students will discuss case in groups		1 hour

Assessment: Formative assessment while discussing in groups

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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	1. The students visit several patient care area and observe functioning of the Multidisciplinary teams, such as the emergency OPD, or OT, or labour room 2. The students may be posted in small groups to observe and reflect with regard to	LCD projector, Flip charts, Marker pens	1 hour

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		important aspects of working in a team: a. Shared goals b. Communication c. Leadership d. Role clarity e. Trust / respect 3. Group presentation and discussion		

3. **Assessment :** Formative assessment during group discussions / presentations

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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 Competencies addressed The student should be able to:	Domain	Level	Suggested TLM	Duration

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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

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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

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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

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	• An interactive lecture on the components	LCD projector, Flip charts, Marker pens	1 hour

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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.

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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

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	• An interactive lecture	LCD projector, Flip charts, Marker pens	1/2 hour
2	Prioritization	• Group work using the “action priority matrix” • Discussion		1 hour

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3	Distractions and Interruptions	• 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

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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

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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

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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	• Lectures (RPT), role plays, group	LCD projector, Flip charts,	3 hours

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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	• 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

Sessions will be organised in small groups and rotated between enhancement skills

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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

https://www.mciindia.org/CMS/wp-content/uploads/2019/01/UG-Curriculum-Vol-II.pdf

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BOARD of GOVERNORS in supersession of 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 3

Critique

Assessment

Collaborate

Clinician Communicator Team Leader Professional Lifelong Learner

Knowledge | Skills | Attitude | Values | Responsiveness | Communication

Curriculum Implementation Support

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Assessment Module for Undergraduate Medical Education 2019

Medical Council of India
Pocket-14, Sector-8, Dwarka,
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How to Cite: Medical Council of India. Assessment Module for Undergraduate Medical Education Training Program, 2019: pp 1-29.

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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.

Dr. V. K. Paul

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MEDICAL COUNCIL OF INDIA
BOARD OF GOVERNORS
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.

(Dr. R.K. Vats)
Secretary General

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Curriculum Implementation Support Program

Module - 3

Assessment

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Guidelines for Assessment in Competency Based UG Curriculum

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 *end of instruction* to check how much the student has learnt.
Formative assessment	An assessment conducted *during* 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.

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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 identify the stage of the learner and decide 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 should incorporate integration to the extent feasible while maintaining subject identity.

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.

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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.

This 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 or only at summative examination. 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]

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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 ascendency. 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 process 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 student in the form of self-assessment and reflections.[4] The paradigm is reflected in figure 1.[5]

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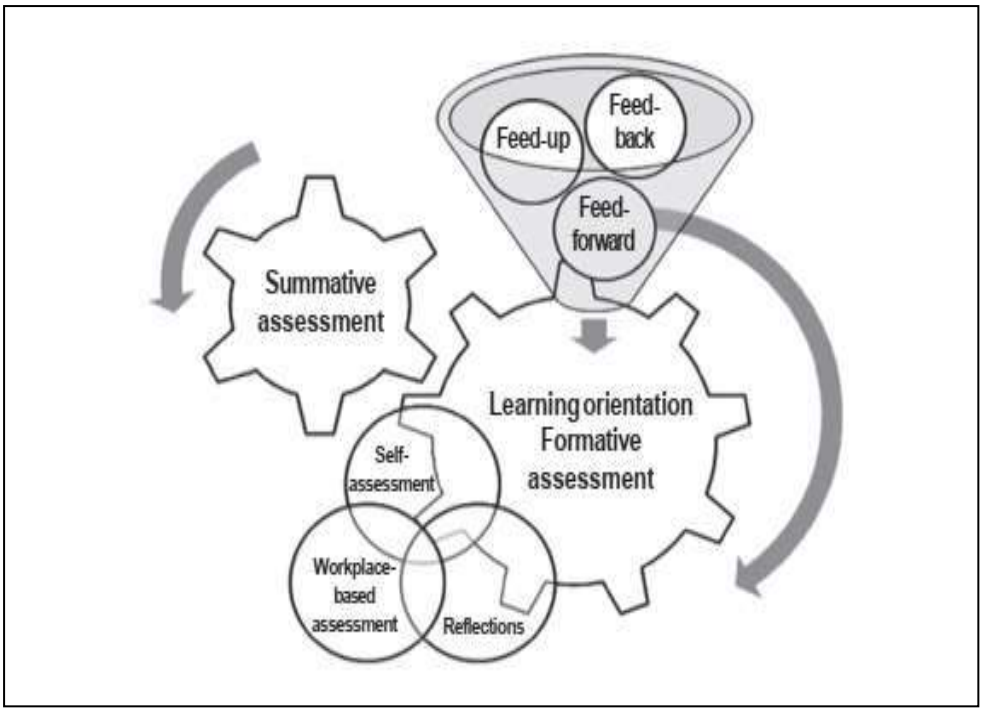


Figure 1. Paradigm of medical student assessment[5]

(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.

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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.

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Features of Competency Based Assessment (CBA)

- CBA operates within the framework of competencies. Assessment tools should align with 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 observation of students improves 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. IA focuses on the content and process of learning i.e. what and how students have learnt throughout the course. This assessment gives priority to psychomotor, communication and affective domains. These domains 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 ownership [illegible] learning-

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learning and assessment as well as provide ‘hands-on’ experience in assessment to all teachers. 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 of 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.

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:

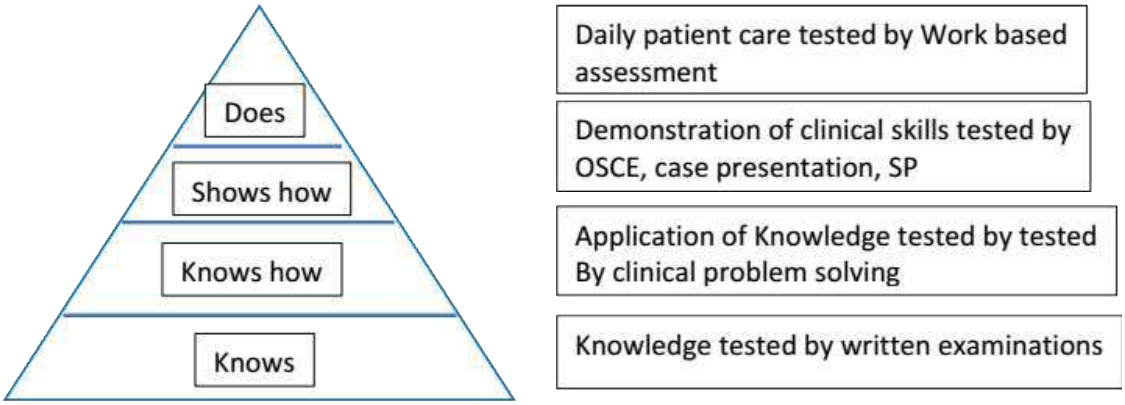


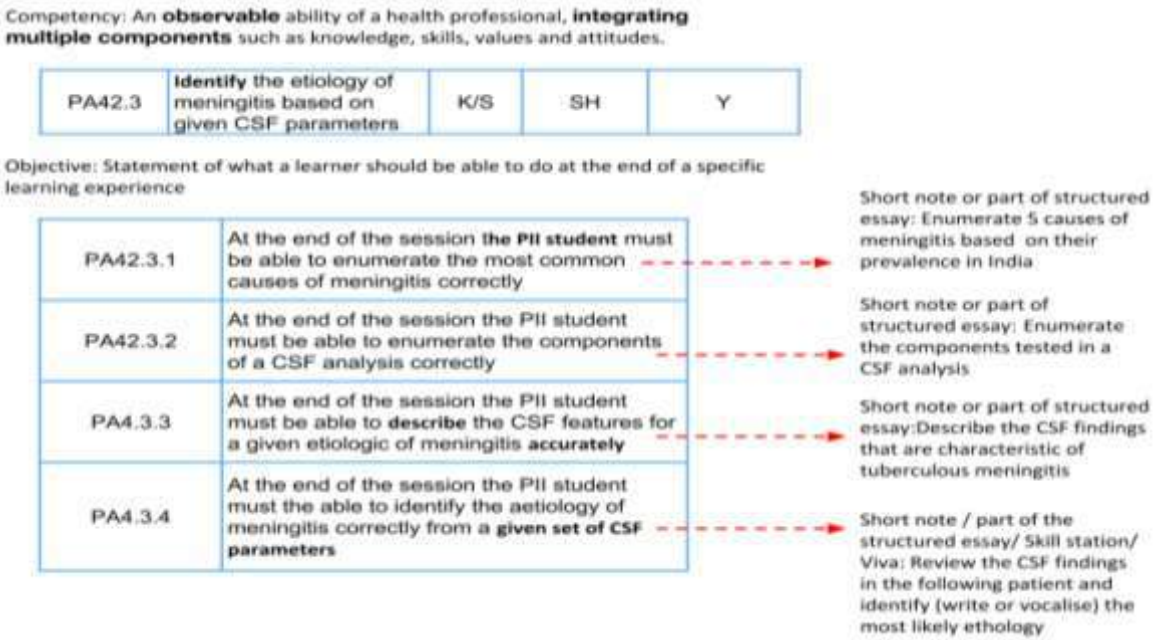
Figure 2. Assessment methods as per levels of competency (Adapted from Ramani)[13]

OSCE: Objective Structured Clinical Examination, SP: Standardised/ Simulated Patients

The key to building validity and making CBA assessment useful is its alignment 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 inTable1.

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Table 1. Deriving assessment methods from objectives



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 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**.** These are minimum required numbers but more tests can be scheduled by departments as required. 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

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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**: Written tests, should have essay questions, 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.

(iii) **Assessment of Log-book**. Log book should record all activities like seminar, symposia, quizzes and other academic activities. Achievement of certifiable competencies should also be recorded in logbooks. It should be assessed regularly and submitted to the department. Up To twenty per cent IA marks (Theory and Practical) should be from Log book assessment.

(iv) **Internal Assessment for Professional development programme (AETCOM)** will include:

a. Written tests comprising of short notes and creative writing experiences in each subject.

b. OSCE based clinical scenarios and/or viva voce. Skill competencies acquired during the Professional Development Programme must be tested during the clinical, practical and viva voce in every subject.

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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 not to 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, while General Surgery should include Orthopaedics, Dentistry, Anaesthesiology and Radio-diagnosis, 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 ECE 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-II. *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 to 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

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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 two 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.**

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 on the 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]

These concepts have been incorporated in the proposed GMER 2019 and are reproduced below.

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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.

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b. Summative assessment logistics (For Universities)

Summative assessment consists of University examinations. Each theory paper will have 100 marks. Marks distribution as per proposed GMER 2019 for various subjects in 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			Internal Assessment: 50%combined in theory and practical (not less than 40% in each) for eligibility for appearing for University Examinations University Examination Mandatory 50% marks in theory and practical (practical = practical/ clinical + viva) [theory=theory paper(s) only] Internal assessment marks are not to be added to marks of the University examinations and should be shown separately in the grade card.
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	

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As per proposed GMER 2019, 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 II will be held in the month of January (Table 3).

Table 3: Examinations schedule

<table>
<tr><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>Jun</th><th>Jul</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Foundation Course</td><td colspan="4">I MBBS</td></tr>
<tr><td colspan="8">I MBBS</td><td>Exam I MBBS</td><td colspan="3">II MBBS</td></tr>
<tr><td colspan="8">II MBBS</td><td>Exam II MBBS</td><td colspan="3">III MBBS</td></tr>
<tr><td colspan="9">III MBBS Part I</td><td>Exam III MBBS Part I</td><td colspan="2">Electives & Skills</td></tr>
<tr><td colspan="12">III MBBS Part II</td></tr>
<tr><td>Exam III MBBS Part II</td><td></td><td colspan="10">Internship</td></tr>
<tr><td colspan="2">Internship</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

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 the 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

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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	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

Table 5: Blueprinting in knowledge domain

(Representative example only. Actual figures may vary with the subject and Phase)

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%)

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Practical/Clinical examination

This part should include assessment in psychomotor and affective domain. Assessment of clinical and procedural skills should be based on direct observations 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 not be usable / 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.

Pre- and para-clinical departments should make practical exercises application oriented. Objective Structured Practical Examination (OSPE), One-Minute Preceptor (OMP), Directly Observed Procedural Skills (DOPS) etc. can be suitably modified for this purpose. Practical tests should not become simply tests of knowledge.

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]

The relevant provisions from proposed GMER 2019 and are reproduced below:

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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 examination 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.

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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 examination 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 disciplines 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.

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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 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 annexures.

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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
1st	Human Anatomy 3, Physiology 3, Biochemistry 3, Community Medicine 1	•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
2nd	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	•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

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3rd	Forensic Medicine &Toxicology 2, Community Medicine 2, Ophthalmology 2, Otorhinolaryngology 2 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 EOP examination at each clinical posting including allied subjects	•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
4th	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 EOP examination at each clinical posting including that in allied subjects	•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 General Medicine, General Surgery, Pediatrics and Obstetrics & Gynaecology should be preliminary or pre-university examination •Assessment of electives to be included in IA

AETCOM: Attitude, Ethics and Communication

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The internal assessment marks for each subject will be out of 100 for theory and out of 100 for practical/clinical (except in General Medicine, General Surgery and Obstetrics & Gynaecology, in which theory and clinical will be of 200 marks each). Internal assessment marks will reflect as a separate head of passing at the summative examination and will not be added to the University marks.

Twenty five percent of weightage in theory tests in General Medicine and General Surgery should be given to allied subjects and there should be at least one question from each allied subject.

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Annexure 2

Examples of theory questions

Sl. No.	Type	Explanation	Examples
1	Long essay question	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. Please avoid simple recall based questions. What is asked in the examination generally sets the agenda of what and how the students learn.	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 5cms and spleen of 2 cms. Other systemic examination is normal. 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. - Describe the clinical features, complications and management of type 2 diabetes mellitus. (3+3+4=10)

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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)	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 newborn 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.	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.

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Sl. No.	Type	Explanation	Examples
4	Short notes Applied aspects	(Pre- & Para-Clinical subjects: questions on applied aspect) (Clinical subjects: questions on preclinical basis)	**Pre & Para-Clinical subjects:** Describe clinical significance of half-life of drugs. **Clinical subjects:** 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.	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? A. Induction of oral contraceptive metabolism B. Stimulation of ovulation C. Interruption of entero-hepatic circulation D. Increased excretion of oral contraceptives Key: A

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Sl. No.	Type	Explanation	Examples
	MCQs		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? a. Urea b. Cholesterol c. Creatinine d. Uric acid Key B 3. Which of the following term best describes the decreased effects of beta adrenergic agonists in bronchial asthma after long term use? A. Pharmacokinetic tolerance B. Pharmacodynamic tolerance C. Tachyphylaxis D. Drug dependence Key: B

Note: AETCOM question should be based on competencies (primarily knowledge based) acquired during the AETCOM module training. 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.

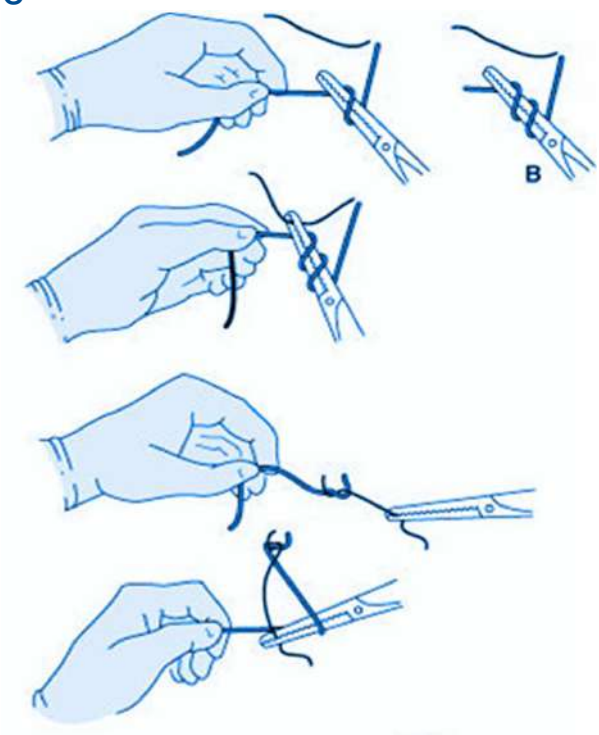
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COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE

Knows → Knows how → Shows → Shows how → Performs

Describe
Enumerate
Observe
Demonstrate
Assist
Counsel
Prescribe
Analyse
Integrate
Guide
Communicate
Correlate
Interpret
Critique
Collaborate



Module 5
Skills Training

Clinician Communicator Team Leader Professional Lifelong Learner

Knowledge | Skills | Attitude | Values | Responsiveness | Communication

Curriculum Implementation Support

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Skills Training Module

(Including Guidelines for Skills Lab)

For Undergraduate Medical Education

Program

2019

Medical Council of India
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New Delhi 110 077

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How to Cite: Medical Council of India. Skills Training Module for Undergraduate Medical Education program, 2019: pp 1-49.

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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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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

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Module – 5

SKILLS TRAINING

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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.

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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),

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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:

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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	• 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	• 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	• Application of basic splints and slings (I) • Basic fracture and dislocation management (O) • Compression bandage (I)

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Gynecology	• 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	• Obstetric examination (I) • Episiotomy (I) • Normal labor and delivery (including partogram) (I)
Pediatrics	• Neonatal resuscitation (D) • Setting up Pediatric IV infusion and calculating drip rate (I) • Setting up Pediatric Intraosseous line (O)
Forensic Medicine	• 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	• Anterior nasal packing (D) • Otoscopy (I)
Ophthalmology	• Visual acuity testing (I) • Digital tonometry (D) • Indirect ophthalmoscopy (O) • Epilation (O) • Eye irrigation (I) • Instillation of eye medication (I) • Ocular bandaging (I)

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Dermatology	• 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.

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.

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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.

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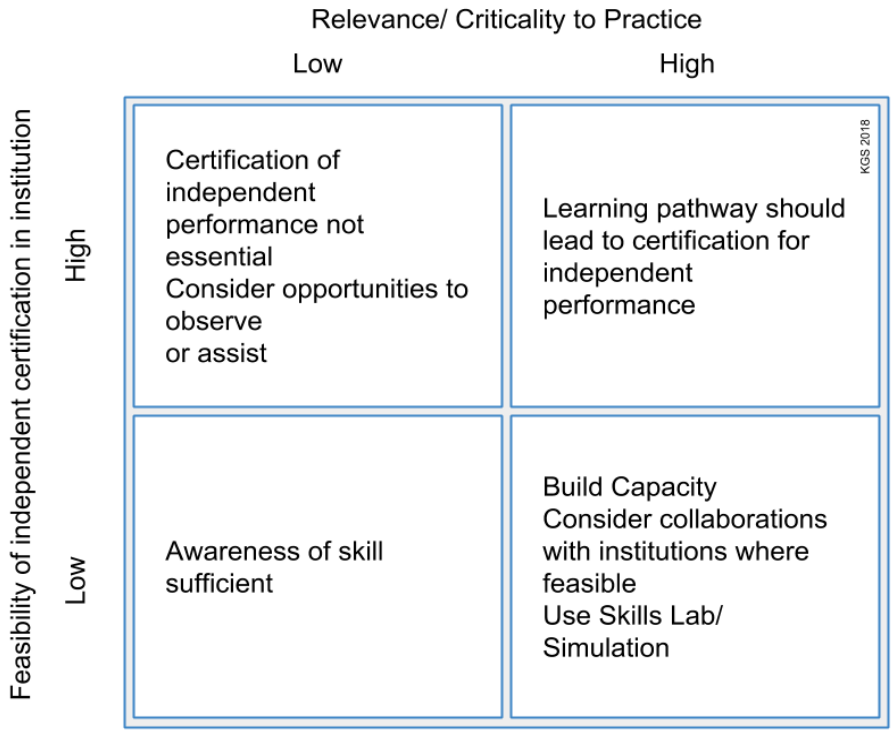


Figure I: Criticality vs feasibility matrix in context to Skills training

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.

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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'.

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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.

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Figure II: Approach to competency based skill development

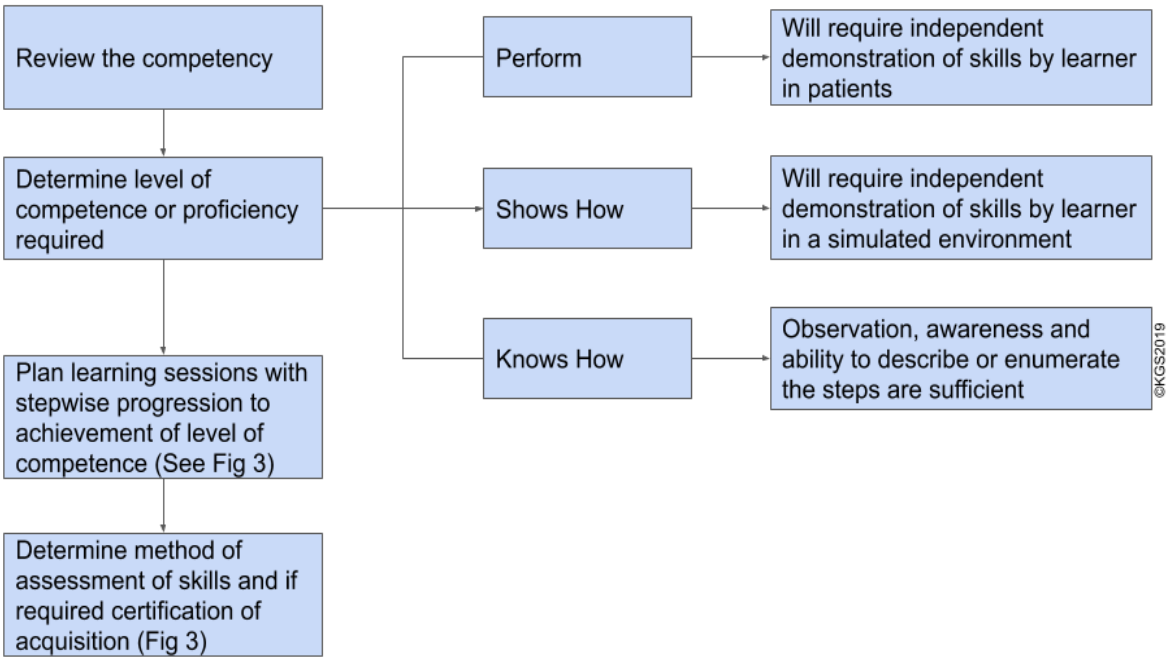
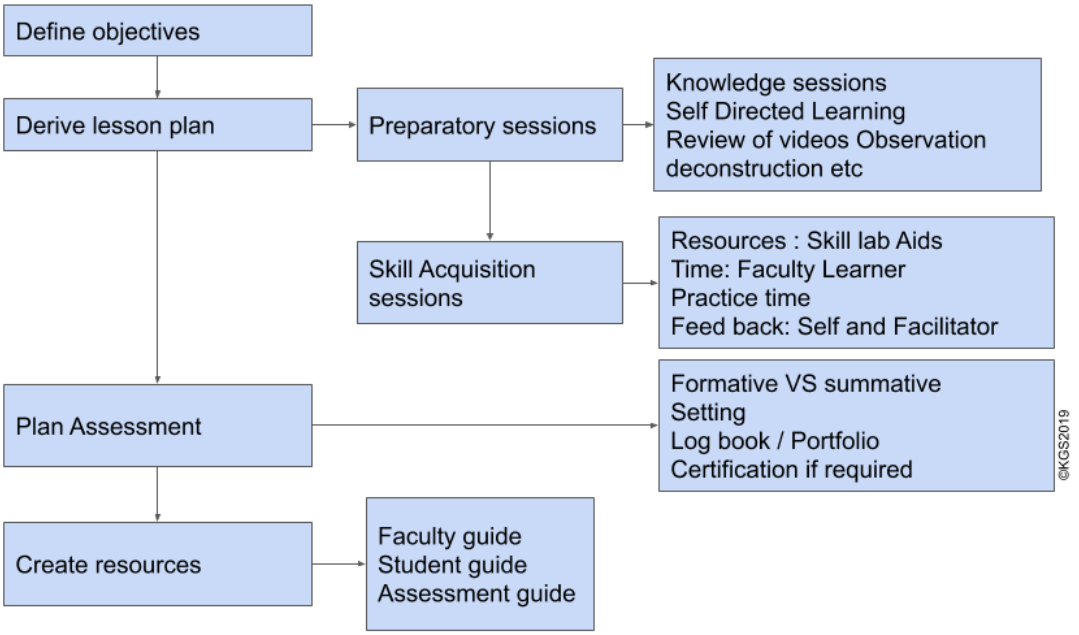


Figure III: Planning a skill session



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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).

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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.

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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

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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 (availableat: 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:

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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.

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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.

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Annexure A

Outline of a Session Plan

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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	

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Annexure B

Examples of Task Training Modules

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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

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- 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 BP.

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- 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

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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 above),

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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.

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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

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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.

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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 (2to 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.

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- 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.

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- 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

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- 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

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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).

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3. Background Knowledge:

AN52.2	Describe & identify the micro-anatomical features of: Urinary system: Kidney, Ureter & Urinary bladder Male Reproductive System Testis, Epididymis, Vas deferens, Prostate & penis Female Reproductive system 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)

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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.

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- 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.

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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.

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- 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.

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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

SU 10.2	Describe the steps and obtain informed consent in a simulated environment	S/A/ C	SH

IM26.15	Identify, discuss and defend, medico-legal, socio-cultural and ethical issues as they pertain to consent for surgical procedures	K	KH

EN 2.12	Counsel and administer informed consent to patients and their families in a simulated environment	S/A/C	SH

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

IM26.35	Demonstrate empathy in patient encounters	S	SH

SU8.2	Demonstrate Professionalism and empathy to the patient undergoing General surgery	A/C	SH

PS1.1	Establish rapport and empathy with patients	A/C	SH

Skill training: Counsel and administer informed consent prior to lumbar puncture to a patient and family in a simulated environment.

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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.

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- 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.

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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.

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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 1st 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.		

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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.

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Annexure C

Guidelines for development of skills lab at medical colleges

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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,

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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.

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COMPETENCY BASED UNDERGRADUATE CURRICULUM
FOR THE INDIAN MEDICAL GRADUATE

Knows Knows how Shows Shows how Performs

Describe Observe Demonstrate
Enumerate Assist
Counsel Prescribe
Analyse Integrate

ELECTIVES

Guide Communicate

Module 6

Correlate Interpret
Critique Collaborate

Clinician Communicator Team Leader Professional Lifelong Learner

Knowledge | Skills | Attitude | Values | Responsiveness | Communication

Curriculum Implementation Support

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Module on Electives

for

Undergraduate Medical Education

Program

2020



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How to cite: Medical Council of India. Electives for the Undergraduate Medical Education Training Program, 2020: p 1- 30.

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Foreword
ELECTIVES

Students who join medicine come in with many professional and personal aspirations. While meeting the needs of the profession and nation, the MBBS program is also designed to create time and opportunity for students to explore future interests. Allowing students time to experience a specialty or project of their choice is thus key to helping student interest bloom.

Creating a diversity of choices within a specified framework that will allow students to be part of a laboratory, participate in research, be part of a super-specialty care team or interact with patients in a community care setting is a mandate of the new regulations notified by the Government of India. Electives allow students to get a taste of a future career; they also allow them to pursue academic interests, do projects and work in diverse environments. These experiences outside the traditional boundaries of the core program allow students to reflect, plan and grow their careers. They also allow students to begin the process of professional networking early.

Institutions must give sufficient importance to the planning and execution of electives. Besides creating diverse opportunities, thought must be given to providing a safe and enabling environment for students to learn. Identifying and orienting preceptors for this purpose, developing portfolio and log book events and continuous program evaluation are key to the success of the program. I urge all institutions to look beyond traditional boundaries to create areas of opportunity for students. Strategic collaborations with centers of excellence will increase value for students while building bridges of collaborative work among institutions.

This booklet is designed to help institutions plan and execute elective rotations. The Expert Group has elucidated a balanced approach that can be followed by all institutions. As always we are keen to learn and share any best practices that institutions develop. I am grateful to the Academic Cell of MCI and the Expert Group as well as the nodal and regional centers of the MCI for their continued contribution in supporting institutions and teachers in implementing the forward looking changes in the new competency based UG curriculum.

Chairman
Board of Governors

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Foreword

Electives

Changes in the Graduate Medical Education Regulations notified by the Government of India in 2019 have been done with a view to create physicians of first contact who are relevant to both their community and the globe. These regulations aim at defining outcomes and help students work towards these. These Regulations also envisage a broader role for trainees as scholars, researchers and specialists. In order to diversify experience, stimulate interest in research and discover learning beyond primary care, an opportunity has been created in the new MBBS program for the student to undertake electives of his or her choice subject to availability. Two months of elective time one each in the basic sciences or research and the other in clinical sciences or community clinics have been created. Leverage has been given to institutions to create these electives based on local circumstances and perceived need. Elective postings are compulsory for students and its successful completion is necessary for students to be able to attend the final examination.

This booklet is intended as a guide for institutions to plan the elective postings. Institutions are requested to provide the opportunity for students to take electives of their choice, if needed through external collaborations, if such opportunities are limited while following the guidelines mentioned in the Graduate Medical Education Regulations and this booklet. I would like to express my gratitude to the Academic Cell of MCI and the Expert Group whose constant guidance has helped in the successful roll out of the new curriculum.

Secretary General, MCI

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Module:

ELECTIVES

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Electives

Introduction

The MBBS program is geared to create a primary care provider of first contact. It also visualises the student as a future scholar, specialist, researcher and scientist.

Provision of avenues in the competency based undergraduate MBBS program for the student to explore and experience various streams of the profession is important. Electives are learning experiences that will provide the learner with an opportunity to gain immersive experience of a career stream, discipline or research project.

The opportunity to “work” in a clinical, laboratory, research, community set up or in a team-based setting at an early stage in the profession is an invaluable experience for learners as this will have lasting impact on their professional life. An elective allows students to think of a career beyond examinations and gives them an impetus to think laterally besides laying down the foundation for future professional pathways. It also allows students to match their aspirations with the ground reality in a field of their dreams.

The revised Regulations on Graduate Medical Education, part II 2019 (GMER 2019) have created such opportunity in the MBBS program providing students options to do electives in basic sciences, join in ongoing clinical programs and in research settings. This document is meant to guide institutions, Curriculum Committee members and MEU faculty of colleges, and teachers on how to prepare and experience the conduct of an elective that incorporates the principles enshrined in the GMER document, 2019.

Objectives

The participant must be able to develop electives for block 1 and block 2 as envisaged in GMER 2019 document.

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Glossary

Elective: An elective is a learning experience created in the curriculum to provide an opportunity for the learner to explore, discover and experience areas or streams of interest.

Block: is a defined time period during which learning experiences are created in a particular specialty, subject or theme.

Log Book: 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 the learner's progression in tasks and competencies. A portfolio is an evidence of events documented in the log book. It includes selected assignments, self-assessment, feedback, work-based and in-training formative assessments, reflections and learnings from planned activity in the curriculum.

Log books are thus linked to portfolios and may be included in the portfolio.

Definitions

An Elective is a learning experience created in the curriculum to provide an opportunity for the learner to explore, discover and experience areas or streams interest in the profession.

Curricular Element or Program addressed

Electives

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Relevant extract from Regulations on Graduate Medical Education, Regulations on Graduate Medical Education (Amendment), 2019, part - II for MBBS course starting from academic year 2019-20 onwards

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.

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9.3.6 It is preferable that the list of 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 postings 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.

Description of Curricular program

Two choices of electives are offered to medical students before the commencement of III MBBS part 2. For the purpose of this document these shall be called Block 1 and Block 2. The salient features of each block and their differences are summarised in Table 1.

Table 1: Salient features of Electives in Block 1 and Block 2

	Block 1	Block 2
When	Before commencement of IIIrd MBBS part 2	Before commencement of IIIrd MBBS part 2
Duration	4 weeks	4 weeks
Focus of electives	Pre-/para - clinical disciplines or in other basic sciences laboratory or join ongoing research programs	Clinical specialties or community clinics (rural or urban)
Nature of learning	Supervised Experiential Immersive Self-directed	Supervised Experiential Immersive Self-directed
Regular clinical postings	Will continue	Will not be offered
Attendance	Mandatorily 75% attendance is required as prerequisite to be allowed	Mandatorily 75% attendance is required as prerequisite to be allowed

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	to take Part 2 summative examination	to take Part 2 summative examination
Assessment	Formative Record of activities in log book and portfolio (or annexure to log book) to be submitted as prerequisite to be allowed to take Part 2 summative exam	Formative Record of activities in log book and portfolio (or annexure to log book) to be submitted as prerequisite to be allowed to take Part 2 summative exam
Out of institution experience	Allowed (note clinical postings allowed to continue)*	Allowed within the city*
Out of city or state experience	Continuation of clinical postings makes this difficult	Allowed with due approval*

* See caveat in text

The primary purpose of block 1 is to provide the learner with research experience in basic sciences OR laboratory sciences OR in clinical sciences. The purpose of block 2 is to provide the learner an explorative experience with guided patient care in a specialty of choice.

Electives in both blocks will require planning and coordination by the institution, various departments involved and preceptors who will directly supervise and guide students. Coordination will also be required with external institutions, community clinics and preceptors as may be required for the conduct of electives.

1. Planning the learning experience

The first step in the process is to plan the learning experience. Given the diversity of blocks there will be some variation in the content style and degree of learning; however, each elective should have the following:

a. defined learning objectives,
b. an identified preceptor responsible for guiding the student,

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c. a pre-published timetable of activities identified for the learner during the elective,
d. list of learning resources for the learner to be used during the elective,
e. provision to be part of the team to obtain an immersive learning experience,
f. prerequisites, if any, to be completed before joining the elective,
g. defined formative assessments with appropriate requirements for portfolio and log book entry, and
h. program evaluation by the stakeholders.

A template for planning learning experiences is provided in Table 2.

Examples of several kinds of learning experiences are found in annexure 1.

Table 2: Template for planning learning experiences in electives

Name of Block	
Name of Elective	
Location of hospital lab or research facility	
Name of internal preceptor(s)	
Name of external preceptor (if any)	
Learning objectives of the elective	
Number of students that can be accommodated in this elective	
Prerequisites for the elective	
Learning resources for students	
List of activities in which the student will participate	
Portfolio entries required	
Log book entry required	
Assessment	
Other comments	

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2. Identifying learning experiences

To ensure that there is an immersive learning experience and greater attention to the learner, each preceptor identified must be tagged with only a minimum number of students. Therefore, it is important to identify a sufficient number of preceptors, laboratory positions, and existing research projects (for block 1) and specialties and community clinics, for block 2. Input from both faculty and students can be sourced to identify electives that are feasible and desired.

If required and feasible, collaboration with external resources including central and private research institutes and laboratories, hospitals and clinics can be done ensuring that the quality and principles outlined in section 1 are maintained. Student-initiated external rotations may be permitted as long as they do not violate institutional rules and conform with the broad principles outlined. Rotations outside the city will require prior permission from the Medical Council of India. Examples (neither exhaustive nor comprehensive) of block 1 and block 2 electives are provided in Table 3.

Table 3: Examples of Block 1 and Block 2 learning experiences

Block 1	Block 2
Laboratory Experience:	**Clinical Specialty Experience:**
Pathology	Emergency room
Microbiology, Virology	Intensive Care unit
Biochemistry	Psychiatry
Genetics	Adolescent Reproductive Health issues
Molecular biology	Neonatology
Immunology	Dermatology
Pharmaco-vigilance and clinical pharmacology	Health care quality and safety

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Infection Control	Rehabilitation and palliative care
Community outreach experience	Sports medicine
Assisted living	Clinical Ethics
Hospice care	**Super-specialty experience**
School Health programs	Hematology
Community outreach for National Health Programs	Oncology
Maternal and child health outreach	Rheumatology
Research	Endocrinology and Diabetes
Student initiated research	Nephrology
Participation in faculty research	Neurosurgery
Community and epidemiologic surveys	Cardiology / Cardiac Surgery
Others	GI surgery
Bioinformatics / Tissue engineering	Organ Transplant Anesthesia
Computers and artificial intelligence in health care	**Urban or Rural community experience**
	Rural Community Health Center
	Primary Health Center
	Corporation health clinic
	Selected private primary care clinic

3. Student counseling and allocation of electives

The list of available learning experiences for each block and the names of preceptors for each should be available to students on the institutional notice board at least three months before the commencement of the electives. A process for submitting applications for both blocks with choices should be made available to

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the students. Written information on each learning experience must be available for students to examine and make an informed choice.

A counseling session with faculty mentors to help students choose electives is desirable. The faculty mentors must ascertain a student's expectation from the electives he/she has chosen. Students must also be made aware of the rules regarding attendance, work schedule, documentation and assessment requirements for each elective. The allocation of electives may be done based on student choice and availability of rotation by faculty who have been identified to be in-charge of the electives program, for each block. The allocation must be done sufficiently in advance and the students informed so that the prerequisites for the electives, if any (such as knowledge training in good laboratory practices, good research practices, CPR training etc.) can be completed by the student. A process to identify the veracity of student initiated electives must be in place.

4. Student research

Block 1 may also be used by students under the guidance of a preceptor to complete funded (e.g. ICMR student grant, institutional grant etc,) or unfunded research projects. In addition, predefined work, monitoring, presentation and writing plan may be finalised by the learner and the preceptor, prior to starting the elective. Students may also participate in a pre-existing research project ongoing under the preceptor.

It is important to define the objectives, role of the student in the project and his or her part in the writing and publication or presentation of a part of the project. An assessment by the preceptor of the student’s role, contribution, involvement and performance must be made. Documentation of experiences, observations, reflections and presentations by the student may be added to the portfolio or as annexure to the log book. Appropriate log book entries that document the student participation and which are verified by the preceptor are critical for successful

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completion of the work undertaken. Similar arrangements must be made if an external preceptor or institution is identified.

5. External institutions

Given the number of positions available in each elective and the need to provide a broad diverse experience for students, colleges can enter into agreements with external institutions within the country to accommodate students for undertaking an elective experience in both block 1 and block 2, as long as this is not in conflict with the rules and policies of the Medical Council of India, the college of the student and the institution identified and the conditions outlined above are complied with. Student-initiated external rotations may not be discouraged provided they meet the expectations of the program as outlined. Out of city/state experiences may be decided based on institutional policy (since clinical postings will continue during block 1, out of city programs may not be feasible here). Out of state electives in block 2 require prior permission from the Medical Council of India. Identifying suitable preceptors in the host institution and briefing them of the expectations and requirements of the program is important. A local preceptor or faculty who can liaise with the external preceptor will help to solve problems and ensure smooth conduct of the elective.

6. Student safety

In each of these electives especially in those involving external rotations, safety of the student should be paramount. Rotations in which the student may be exposed to potentially hazardous situations must be avoided. It must be made clear to the preceptors by the college authorities that students need to be supervised and must not be involved in patient care as the responsible health provider. When required, students must complete the prerequisite training such as good laboratory practice, universal precautions, good clinical practice etc. before being allowed to participate in electives. The student must be oriented to the program through a formal

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orientation process that spells out the expectations/outcomes and the precautions to be observed.

7. Assessment

Assessment will be formative (refer to MCI module no. 3 on Assessment, for details). Attendance of not less than 75% and successful completion of items that require log book entry and their submission is a requirement for the student to become eligible to take the final examination. Assessment elements could include participation in grand rounds, seminars, case records, submission of assignments, reflection on learnings, preparation of abstracts for research posters, design and participation in patient education programs etc. The module on Log book available on the MCI Website may be consulted for further information.

8. Program evaluation

Provision for evaluation of the program based on information from all stakeholders should be made in order to evaluate the effectiveness of the program and need for modifications and improvement.

9. Curricular governance

The Curriculum Committee of the college constituted as per MCI norms and headed by the Dean of the college will be responsible for the design, conduct, implementation and evaluation of the elective program. The design and conduct of block 1 may be assigned to Phase 1 and Phase 2 subcommittees constituted by the Dean while that of block 2 may be assigned to Phase 2 Sub-committee. The departmental heads and preceptors are responsible for the day-to-day conduct of the program, guiding and supervising and assessing students.

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Annexure 1

1. Example of a learning experience in block 1

Table 4: Example of a block 1 learning experience

Name of Block	Block 1
Name of Elective	Medical Genetics
Location of hospital Lab or research facility	Medical College hospital
Name of internal preceptor(s)	Name/s
Name of external preceptor (if applicable)	N/A
Learning objectives of elective	1. to demonstrate the conduct of commonly available genetic tests in a controlled environment 2. to enumerate indications for common genetic tests 3. To enumerate the testing protocol for commonly performed genetic tests 4. to demonstrate the correct method to perform a karyotype 5. to present a genetic history and determine the nature of inheritance of a given condition
Number of students that can be accommodated in this elective	4
Prerequisites for elective	Necessary immunisations, Universal precaution certification
Learning resources for students	Departmental handbook provided
List of activities of student participation	1. Work daily with a supervisor in observing, assisting and performing genetic tests 2. Participate in departmental education activities 3. Present at least two tests done by student as a case work up

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Portfolio entries required	1. Documentation of worked up cases 2. Documentation of presentation done
Log book entry required	Completion of posting signed by preceptor with a “meets expectation ‘(M)’ grade”
Assessment	**Formative:** attendance; day-to-day participation in departmental activity; performance of assigned tasks and presentation of worked up case in department
Other comments	

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2. Example of a learning experience in block 2

Table 5: Example of a block 2 learning experience

Name of Block	Block 2
Name of Elective	Diabetology
Location of hospital Lab or research facility	Medical College hospital
Name of internal preceptor(s)	Name/s
Name of external preceptor if applicable	N/A
Learning objectives of elective	1. To provide care for patients with diabetes in a supervised environment 2. To function effectively as a team member in a multidisciplinary team managing diabetes 3. To counsel patients about diabetes care appropriately 4. To describe the pathophysiological clinical correlates as they apply to care of patients with diabetes
Number of students that can be accommodated in this elective	6
Prerequisites for elective	Must have received necessary immunisations, Basic Life Support training
List of activities of student participation	1. Participate in OP and IP rounds 2. Participate in afternoon teaching sessions of the department 3. Present at least two cases that are fully worked up in the teaching session 4. Participate in patient education and multidisciplinary team meetings 5. Participate in audit meetings
Learning Resources	Seshadri K: Clinician's handbook of diabetes

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Portfolio entries required	**Assignments provided** Two worked up case records that have been presented Documentation of self-directed learning as summary and reflection
Log book entry required	Satisfactory completion of posting by a preceptor with a “meets expectation ‘M’ grade”
Assessment	Attendance **Formative:** Participation in OP & IP rounds and team activities, Presentation of worked up cases, Documentation of attendance and required portfolio and log book entries
Other comments	

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3. Example of a research rotation in block 1

Table 6: Example of a research learning experience in block 1

Name of Block	Block 1
Name of Elective	Research (Preceptor initiated)
Location of hospital Lab or research facility	Medical College hospital
Name of internal preceptor(s)	Name
Name of external preceptor	N/A
Learning objectives of elective	1. To collect data as prescribed in the protocol 2. To document data in the electronic case record correctly 3. To demonstrate the use of statistical software to do basic research calculations 4. To write an abstract based on the collated data 5. To present abstract to a group of peers and supervisors
Number of students that can be accommodated in this elective	4
Prerequisites for elective	Good clinical practice, Good laboratory practice
List of activities of student participation	1. Work with supervisor in making observations, collect data and document as per protocol 2. Work with statistician to provide a statistical analysis of the data 3. Participate in research meetings of the department, internal and external meetings 4. Write abstract of work done 5. Present abstract in an internal meeting and if possible at an external meeting as a poster or oral presentation

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Learning Resources	Sackett DL: Clinical epidemiology Robbins & Cotran Pathological basis of disease
Portfolio entries required	Laboratory notes Statistical work sheet Abstract created
Log book entry required	Satisfactory completion of posting with a “meets expectation ‘(M)’ grade”
Assessment	Attendance Successful completion of research objectives and log book entry
Other comments	

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4. Example of an external rotation in block 2

Table 7: Example of a community clinic rotation in block 2

Name of Block	Block 2
Name of Elective	Community Clinic
Location of hospital Lab or research facility	Primary health care center in (name of) a village
Name of internal preceptor(s)	Name
Name of external preceptor if applicable	Name
Learning objectives of elective	1. To provide primary care to patients in a resource limited setting under supervision 2. To function as a member of a health care team in a primary care center 3. To participate in health outreach activities of a primary care center
Number of students that can be accommodated in this elective	6
Prerequisites for elective	Required immunisations to be taken, BLS, Basic Suturing and first aid
List of activities of student participation	1. Provide patient care under the supervision of a community clinic preceptor 2. Assist in common procedures in a community care clinic 3. Counsel patients in their own language 4. Participate in national health care programs offered through the PHC 5. Participate in team meetings of the PHC
Learning Resources	The Washington Manual of Medical Therapeutics, 2019

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Portfolio entries required	Daily log of patients seen and activities participated At least 04 fully worked up patients to be documented
Log book entry required	Satisfactory completion of posting by external preceptor co-signed by institutional preceptor
Assessment	Attendance Successful verification of required portfolio entries, Successful completion of the posting as certified in the log book with a “meets expectation ‘M’ grade”
Other comments	

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5. Example of a block 1 rotation in emerging infections

Table 8: Example of a learning experience in block 1 in virology

Name of Block	Block 1
Name of Elective	Emerging viral infections
Location of hospital Lab or research facility	Medical college hospital
Name of internal preceptor(s)	Name
Name of external preceptor if applicable	N/A
Learning objectives of elective	1. To obtain experience in the laboratory investigation of viral outbreaks 2. To obtain experience in diagnostic testing in viral diseases
Number of students that can be accommodated in this elective	6
Prerequisites for elective	Universal precautions and Good laboratory practice modules to be completed
List of activities of student participation	1. Participate in laboratory activities including sample processing, sequencing RT PCR viral cultures etc. 2. Participate in academic programs of the department 3. Write up the laboratory work up of two patients with viral illness 4. Visit to a center with electronic or confocal microscope 5. Present at least two cases in departmental academic forum
Learning Resources	Handbook of Virology testing
Portfolio entries required	Lab Notes and work book entries; Presentations done

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Log book entry required	Satisfactory completion of posting authenticated by preceptor
Assessment	Attendance Successful verification of required portfolio entries, Successful completion of the posting as certified in the log book with a “meets expectation ‘M’ grade”
Other comments	

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6. Example of a block 2 rotation in emerging infections

Table 9: Example of a learning experience in block 2 in virology

Name of Block	Block 2
Name of Elective	Clinical infectious disease and virology
Location of hospital Lab or research facility	Medical college hospital
Name of internal preceptor(s)	Name
Name of external preceptor if applicable	N/A
Learning objectives of elective	1. To function as part of an infectious disease team 2. To be able to approach and investigate infection outbreaks 3. Get hands on experience on contact tracing, community isolation measures, and use of technology 4. To understand the principles of the management of viral infections
Number of students that can be accommodated in this elective	6
Prerequisites for elective	Universal precautions and must have taken required immunizations; CPR training
List of activities of student participation	1. Participate in inpatient and outpatient team rounds 2. Participate in community outbreak investigations 3. Counsel patients on correct precautions during outbreaks 4. Diagnose and understand the principles in the management of viral diseases 5. Liaise with the laboratory in the diagnosis 6. Present at least one patient or outbreak investigation in the departmental meeting

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Learning Resources	Handbook of clinical virology
Portfolio entries required	Case record of at least one patient Record of patient counseling session or contact tracing done
Log book entry required	Satisfactory completion of posting by preceptor
Assessment	Attendance, Successful verification of required portfolio entries, Successful completion of the posting as certified in the log book with a “meets expectation ‘M’ grade”
Other comments	

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COMPETENCY BASED UNDERGRADUATE CURRICULUM

Knows Knows how Shows Shows how Performs

Describe
Discuss
Counsel
Analyse
Differentiate
Activate
Deploy





Monitor
Predict
Integrate
Communicate
Interpret
Define

Pandemic Management Module for UG

Module 7

Clinician Communicator Team Leader Professional Lifelong Learner

Knowledge | Skills | Attitude | Values | Responsiveness | Communication

Curriculum Implementation Support Program

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Module on Pandemic Management

August 2020

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

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How to Cite: Medical Council of India. Module on Pandemic Management, August 2020: pp 1-81.

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Foreword

Pandemic Management

The Medical Council of India has prepared revised Regulations on Graduate Medical Education and competency based Undergraduate curricula, accompanied by detailed guidance for its implementation. One of the desirable outcomes of the Competency derived education program is to enable the Indian Medical Graduate to be prepared for the unknown - to be able to understand, investigate, treat and prevent new and emerging diseases as a clinician, community leader and scholar. The emergence of COVID19 and its rapid spread across the globe has further underlined the need to develop these skills in our graduates.

This Pandemic Management module is designed to ensure that the MBBS student acquires competencies in handling not only the illness, but also the social, legal and other issues arising from such disease outbreaks. A pandemic or disease outbreak calls in to play all the five roles envisaged for the Indian Medical Graduate viz. clinician, communicator, leader and member of health care team, professional, life-long learner and committed to excellence, is ethical, responsive and accountable to patients. It is expected that this longitudinal module extending from Foundation Course to the final year undergraduate program will help in ensuring the creation of an IMG who will serve humanity as a doctor, leader and healer in bleak times such as the occurrence of a pandemic.

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 in creating a generation of Indian Medical Graduates who will be able to provide promotive, preventive and curative aspects of health care to the nation in times of extreme need like the outbreak of a pandemic.

Chairman, Boa

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MEDICAL COUNCIL OF INDIA
BOARD OF GOVERNORS
IN SUPERSESSION OF MEDICAL COUNCIL OF INDIA

Foreword

Pandemic Management

The world community including India is facing an unprecedented crisis due to the rapidly spreading Covid-19 infection, across countries and continents. Recent reports indicate Covid-19 cases have crossed the 18 million mark globally. The impact of Covid-19 infection is being felt severely on the health sector. An acute necessity is being felt to maximise the health care facilities available in the country particularly the availability of trained health care workers to meet this unexpected health crisis.

The Competency based undergraduate curriculum was designed to enable the Indian Medical Graduate to be prepared to meet new challenges - to be able to recognise, diagnose, investigate, and treat newly emerging diseases as a clinician and community health leader; the Covid-19 pandemic outbreak has provided this opportunity. The longitudinal module on Pandemic Management extending from Foundation Course to the final year undergraduate program prepared by the Academic Cell and Expert Group is designed to provide year-wise detailed protocols in training the students to fulfil their role as a doctor, leader and healer during this difficult period of a rampaging pandemic. The Medical Council of India is appreciative of the efforts of the members of the Expert Group and the Academic Cell in preparing this module in a very short time.

Vatm 19/8/20
(Dr. R.K. Vats)
Secretary General

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How to use this document

This document has been prepared, considering the metamorphosis of a first year MBBS student to the Indian Medical Graduate (IMG) and the knowledge and competence that is expected from him/her in adapting to and managing a clinical condition that is predicted to happen, too often in the form of outbreaks, epidemics and pandemics, during his/her career.

The module is arranged in a Phase-based manner. It is expected that components of Self Directed Learning, Early Clinical Exposure, Integration and alignment as envisaged in the Competency documents (2018) would be incorporated in the execution of these modules in various phases, as applicable. It is also expected that the modules would be covered by an interdisciplinary team under supervision by the college level Curriculum Committee. The major coordinating departments involved in the execution of this document are identified in the table below.

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Longitudinal Module on Management of Pandemics for MBBS course

Period	Module	Broad areas	No. of hours	Major department(s) to coordinate
Foundation Course	F.1	History of Outbreaks, Epidemics & Pandemics	2	Pre-Clinical
Phase I	1.1	Infection Control: Part - I Infection Control Practices – Hand washing, Decontamination Use of PPEs	4	Microbiology
Phase II	2.1	Infection Control: Part II Air borne precautions Contact Precautions Infection Control Committee	4	Microbiology
	2.2	Emerging and Re-emerging infections, early identification and control of new infections	6	Community Medicine
	2.3	Sample Collection, Microbial diagnosis, Serologic tests and their performance parameters	6	Microbiology
	2.4	Vaccination strategies including vaccine development & Implementation	6	Community Medicine, Biochemistry
	2.5	Therapeutic strategies including new drug development	6	Pharmacology, General Medicine
Phase III Part 1	3.1	Outbreak Management including Quarantine, Isolation, Contact Tracing	5	Community Medicine
	3.2	Interdisciplinary Collaboration, Principles of Public Health Administration, Health Economics, International Health	5	
	3.3	Operational Research, Field work, Surveillance	8	
Electives		Epidemiology and research Components		Community Medicine
Phase III Part 2	4.1	Care of patients during Pandemics	6	Clinical departments (General Medicine, Pulmonary Medicine, Anaesthesiology as Integrated sessions)
	4.2	Emergency Procedures	8	
	4.3	Death related management	2	
	4.4	Communications and media management	4	
	4.5	Intensive Care Management during Pandemics	4	
	4.6	Palliative Care during Pandemics	4	
		Total	80 hours	

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Skills suggested

1. **Infection Control related**
    a. Hand washing
    b. PPE Donning & Doffing
    c. Disinfection

2. **Diagnostic**
    a. Sample collection
    b. Sample transportation & storage
    c. Choose the appropriate test based on performance parameters

3. **Disease Management**
    a. Pharmaco-vigilance measures
    b. Protocol based Management
    c. Therapeutic decision making
    d. Terminal care including CPR, ALS, PALS

4. **Epidemic Management**
    a. Outbreak investigation
    b. Contact tracing, Quarantine and Isolation
    c. Surveillance
    d. Documentation

5. **Research**
    a. Operational research
    b. Clinical trial protocol preparation including Vaccine trials
    c. Ethical considerations

6. **Communication**
    a. To the media
    b. Use of Telemedicine
    c. Patient & stakeholder communication

7. **Intensive Care**

8. **Palliative care during pandemics**

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Foundation Course

Module F

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Module F.1
History of Outbreaks, Epidemics & Pandemics

Background:

The occurrence of disease is a common phenomenon in communities. The frequency with which disease occurs in a population depends upon a number of epidemiological factors specific to the host, agent and environment including geographical location. Most of the diseases occur with a predictable frequency which is considered as normal for the population in that area. If there is increase in the frequency (more than expected), change in type of host population, clinical manifestations or involvement of newer geographical locations, then depending upon the extent of involvement, an outbreak, epidemic or pandemic has occurred.

A medical student must be aware of such events that have occurred in the past. This can help them learn from historical events, particularly causative or precipitating factors that might have resulted in such events, the most successful strategy that lead to its control and ways that can help in predicting and controlling future events of similar nature and / or magnitude.

Competencies addressed:

The student should demonstrate the ability to:	**Level**
Define pandemic and differentiate it from outbreak/epidemic.	K
Identify the reasons and /or events that lead to pandemics in the past.	KH
Describe key strategies (by the State/Central Government, Non-Government Organization and society at large) that were adopted in prevention and control of these pandemics.	KH
Discuss the role which will be played by National and International bodies like WHO and ICMR, if these events take place	KH

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Learning Experience

Year of study: Foundation course Professional year 1

Hours: two (02)

i. Reading history of pandemics in small groups- 0.5 hours

ii. Identifying reasons/events that lead to these pandemics - 0.5 hours

iii. Sharing with large group & summarizing learning points - 1 hour

Students can also be given assignments where they can come prepared with the history of pandemics in the past through online/offline resources or hand outs can be made for them to discuss in class.

Some of the points for discussion in small group can be-

- Type of microbe involved in the pandemic and its properties that helped it spread e.g. route of entry and exit from host, mechanism of transmission involved, ability to survive on various external surfaces etc.
- How did the microbe evolve? Is this emerging or re-emerging in nature?
- Identify common factors in the community that helped the microbe to re/emerge and spread e.g. deforestation, change in trade practices, Host characteristics that supported the spread etc.
- Impact on health, economics and society,
- Steps taken to control the pandemic,
- Time taken to control,
- Current state of infection by that organism.

Assessment

1**. Formative**: Not required

2. **Summative:** Not required

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Introductory write-up:

A **pandemic** is derived from a Greek word (*pan*, ="all" and *demos*, ="people"). This is an epidemic that affects a significant number of people across a large geographic location, multiple continents or worldwide. Pandemics usually are caused by new microbes, particularly viruses. A large number of previously unexposed population is highly susceptible to these new microbes and if the disease is capable of human to human transmission, then the spread of these organisms is quite rapid leading to pandemics with major impact on society.

Thus, depending upon the pathogenic/ virulence properties of the new microbe, host susceptibilities and risk factors, pandemics can result in significant increase in morbidity and mortality in affected population in large geographic areas with huge impact on the economic growth, social life, and political parties.

Though most of the times it is difficult to pinpoint the factors that result in emergence or re-emergence of microbes capable of causing pandemics, some of the factors that are contributing significantly are global travel, industrial development, urbanization, global food production, wildlife trade, deforestation and overall misuse of nature. Socio-economic and anthropogenic environmental changes have resulted in emerging zoonosis, which can spread and cause pandemics as had happened in the spread of Black Death in the 14th century due to expansion of trade routes.

Further, the way the world is connected today, human beings have become extremely vulnerable to the rapid spread of new infections including zoonosis. A primarily animal pathogen can evolve into a human pathogen, and then with time, need for the original animal host is lost as microbes establish human-to-human transmission. Though this is a gradual process, but it has resulted in evolution of many predominantly human viral pathogens like smallpox, Human Immunodeficiency Virus(HIV), Nipah virus, Rabies, West Nile viruses, Ebola, Marburg, human monkey pox viruses, influenza A, dengue, SARS, Corona virus etc. resulting in widespread outbreaks, epidemics as well as pandemics.

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As declared by the World Health Organization, the latest pandemic that we are facing globally is Covid-19 pandemic, a respiratory illness caused by the newly identified Coronavirus, which has originated in the live market of Wuhan in China. But this is not new as a large number of pandemics have happened in the past and few examples of devastating pandemics are given below:

1) Antonine Plague (165 AD)

Death Toll: 5 million
Cause: Unknown
Antonine Plague was an ancient pandemic that affected Asia Minor, Egypt, Greece and Italy and is thought to have been either Smallpox or Measles, though the true cause is still unknown.

2) Plague of Justinian (541-542 AD)

Death Toll: 25 million
Cause: Bubonic Plague
Generally regarded as the first recorded incident of the Bubonic Plague, killed up to a quarter of the population of the Eastern Mediterranean and devastated the city of Constantinople by killing an estimated 5,000 people per day and eventually resulting in the deaths of 40% of the city's population.

3) The Black Death (1346-1353 AD)

Death Toll: 75 – 200 million
Cause: Bubonic Plague
Bubonic Plague is thought to have originated in Asia. It spread most likely via the fleas living on the rats that commonly lived on merchant ships. Ports being major urban centres at the time, gave the perfect breeding ground for rats and fleas, and thus the insidious bacterium flourished, devastating three continents.

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4) Third Cholera Pandemic (1852–1860 AD)

Death Toll: 1 million

Cause: Cholera

Third Cholera Pandemic was the deadliest of the seven cholera pandemics. This originated in India, spreading from the Ganges River Delta before spreading through Asia, Europe, North America and Africa. British physician John Snow succeeded in identifying contaminated water as the means of transmission for the disease.

5) Flu Pandemic (1889-1890 AD)

Death Toll: 1 million

Cause: Influenza virus

It was also known as “Asiatic Flu” or “Russian Flu”. This was thought to be an outbreak due to the Influenza A virus. Rapid population growth of the 19th century, particularly in urban areas, helped in the spread of the flu, and the outbreak spread rapidly across the globe.

6) **Sixth Cholera Pandemi**c (**1899-1923)**

Death Toll: 800,000+

Cause: Cholera

Originated in India then spread to the Middle East, North Africa, Eastern Europe and Russia.

7) Flu Pandemic (1918)

Death Toll: 20 -50 million

Cause: Influenza virus

1918 flu pandemic was different from other influenza outbreaks. The host properties of Influenza virus were affecting the juveniles previously and the elderly or already immunologically weak individuals but, the new strain had infected and killed completely

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healthy young adults, leaving children and those with weaker immune systems still alive.

8) Asian Flu (1956-1958)

Death Toll: 2 million

Cause: Influenza virus

Asian Flu was a pandemic outbreak of Influenza A of the H2N2 subtype, that originated in China in 1956 and lasted until 1958.

9) Flu Pandemic (1968)

Death Toll: 1 million

Cause: Influenza virus

“The Hong Kong Flu” was caused by the H3N2 strain of the Influenza A virus. Outbreak appeared in July 1968 in Hong Kong and by September 1968 virus had spread to Philippines, India, Australia, Europe, and the United States.

10) HIV/AIDS Pandemic (at its peak, 2005-2012)

Death Toll: 36 million

Cause: HIV/AIDS

It was first identified in the Democratic Republic of the Congo in 1976.Currently, there are nearly 35 million people living with HIV. As awareness has grown, new treatments have been developed that make HIV far more manageable, and many of those infected go on to lead productive lives.

11) Covid-19, the novel Coronavirus:

In December 2019, in the region of Wuhan, China, a new (“novel”) Coronavirus began appearing in human beings. This new virus named as Covid-19, spreads incredibly quickly among people, due to its newness – no one had immunity to Covid-19, because no one had Covid-19 until 2019. Countries across the world declared mandatory stay-at-home measures, closing schools, businesses, and public places to curtail the spread of disease.

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The outcome of the Covid-19 pandemic is difficult to predict, at least presently. But we can learn from the history of pandemics to determine our best course of action.

Dealing with pandemics

Looking back in history, we can see respiratory viruses, particularly influenza viruses have been a major cause of repeated pandemics. This has justified the need for global influenza surveillance and monitoring systems, so as to keep an active surveillance of the strains of virus, their pathogenic potentials and host preferences. WHO has developed pandemic phases in 1999 with latest revisions in 2009 as planning tools that can loosely correspond to pandemic risk, identify sustained human to human transmission and give time for preparedness and response. These tools are not designed to predict. The six phases as given by WHO can be studied in three stages-

1. Inter-pandemic phase
2. Pandemic alert period
3. Pandemic phase

Thus, a basic understanding of these phases provides a framework to help countries to tackle the pandemic and prepare response planning.

Preparedness for impending pandemics is a necessary step to successful handling with minimal loss of life, economic and social disruptions. This requires involvement of government leadership, health sector, on-health sectors, individuals, families, and communities whole-heartedly. Activities that lead to capacity development, planning, coordination, and communication at various levels are critical for successful management.

The **WHO** plays an important role in rapid detection and verification of health emergencies like pandemics, as this is essential to save lives. WHO works with Member States across a range of activities, including coordination under the International Health Regulations (2005). Some of the important activities are:

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Within 48 hours of an emergency, WHO

- Grades the severity of the event,
- Deploys field teams and activates global stockpiles of essential supplies, including personal protective equipment, medicines, and vaccines.
- Communicates the risk to the community and neighbouring countries through official International Health Regulations.
- Activates the Global Health Cluster, the Global Outbreak Alert and Response Network (GOARN), emergency medical teams and standby partners.
- WHO also develops new technologies to be able to detect and track new health events in the most difficult settings, such as the Early Warning, Alert and Response System (EWARS).
- Helps countries strengthen their public health surveillance system.
- Provides guidance on risk communications.
- Advises countries on establishing or accessing laboratory services.
- Enhances laboratory biosafety and biosecurity capacities.
- Increases domestic testing capacity in range and volume.

The WHO also supports Member States with the help of the World Bank, UNICEF, the World Food Programme and other partners to deliver universal health coverage and basic health services during these times. The WHO also deploys mobile medical teams and maintains stockpiles of essential supplies, life-saving medicines and personal protective equipment that can be dispatched quickly across the world. The WHO Emergency Medical Teams (EMT) Initiative also helps organizations and Member States build national capacities and stronger health systems so that countries have the ability to respond promptly when a disaster strikes or an outbreak flares.

Role of the **Indian Council of Medical Research (ICMR)**

The ICMR, New Delhi is one of the oldest medical research bodies in the world and apex body in India. This is the main national agency for the Planning, Formulation, Coordination, Implementation and Conduct or promotion of biomedical research in India.

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For prevention and control of influenza outbreaks, ICMR Influenza Network was initiated in 2003. The influenza network collects clinical data, epidemiological data from patients with influenza-like illness (ILI) and severe acute respiratory infections (SARI) from several clinical virology setups in India. The surveillance database contains data on genetic characterization of the influenza viruses isolated. The network provides useful data for monitoring circulating influenza strains, detection of emerging/re-emerging viruses and defining seasonality in different geographical areas.

Thus, ICMR plays a very active role in monitoring and helps in predicting impending pandemics.

Indian Council of Medical Research is also coordinating “India COVID-19 Clinical Research Collaborative Network”. The goal of this network is to enhance the clinical understanding of Covid-19 in the country so as to develop specific clinical management protocols and further R&D for therapeutics. For this purpose, a central database of clinical and laboratory parameters of hospitalized Covid-19 cases is being created. All hospitals currently managing Covid-19 patients are invited to become partners in the network. ICMR also issues timely advisories required in testing and treatment of patients during pandemics.

Resources:

(1) Swetha G, Eashwar VM, Gopalakrishnan S. Epidemics and Pandemics in India throughout History: A Review Article. Indian Journal of Public Health Research & Development. 2019; 10(8):1570-6.
(2) https://www.ncbi.nlm.nih.gov/pubmed/30212163.
(3) Hughes JM, Wilson ME, Pike BL, Saylors KE, Fair JN, Le Breton M, Tamoufe U, Djoko CF, Rimoin AW, Wolfe ND. The origin and prevention of pandemics. Clinical Infectious Diseases. 2010 Jun 15; 50(12):1636-40.
(4) Daszak P. Anatomy of a pandemic. The Lancet. 2012 Dec 1;380 (9857):1883-4. The Lancet’s Zoonoses Series; http://www.thelancet.com/series/zoonoses.
(5) https://www.mphonline.org/worst-pandemics-in-history/

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(6) WHO Global Influenza Preparedness Plan. The role of WHO and recommendations for national measures before and during pandemics, World Health Organization. 2005 (WHO/CDS/CSR/GIP/2005.5).
(7) https://www.who.int/activities/rapidly-detecting-and-responding-to-health-emergencies.
(8) https://www.who.int/activities/strengthening-national-emergency-preparedness.
(9) https://www.who.int/activities/accessing-essential-health-services-in-fragile-conflict-affected-and-vulnerable-settings.
(10) https://www.who.int/activities/building-a-skilled-workforce-to-respond-to-emergencies.
(11) Dasgupta, S., & Crunkhorn, R. (2020). A History of pandemics over the ages and the human cost. The Physician, 6(2). https://doi.org/10.38192/1.6.2.1.

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Phase I: Module 1

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Module 1.1
Infection Control Practices- Part I

Background:

Exposure to infectious organisms is a common phenomenon but development of disease following such exposures can be easily prevented by following certain practices that have been labelled as “Standard Precautions”. It has been shown in studies that students who receive education about standard precautions have a higher level of knowledge and comply better. Various studies along with “Patient Safety Module” by WHO strongly recommends incorporation of infection control modules in the curriculum of medical schools as medical students, the future doctors need to understand these concepts at an early stage to be able to incorporate them in their practice. The student must be taught scientific bases of these practices that can protect against infections both in community as well as hospital settings. The student should be taught about the basics of Infection control practices with emphasis on ability to use Personal Protective Equipment (PPE) optimally.

This module is aimed at enabling the learner to practise standard infection control practices including proper and consistent hand washing, use of PPEs and to familiarise with various disinfection and antiseptic procedures.

Competencies addressed

The student should be able to:	**Level**
Demonstrate proper hand washing	SH
Demonstrate Donning and Doffing of PPE	SH

Learning Experience

Year of study: Professional year 1

Hours: 4 hours

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I. Interactive discussion – 1 hour
   a. Basics of infection and chain of transmission,
   b. Significance and ways of infection prevention,
   c. Role of hand in spread of infections and importance of hand hygiene in prevention of spread of infections,
   d. Components of standard precautions and use of PPE,
   e. Cough etiquette.

II. DOAP session on hand washing, use of gloves, mask, donning and doffing of PPE -1 hour

III. Visit to the hospital and discussion with the staff about the infection control practices followed by them - 1 hour

IV. Debriefing and Feedback - 1hour

Assessment

1. **Formative:** Viva can be used. This could be done immediately after the module and/or later with internal assessment.

   The technique of hand washing and donning & doffing of gloves can be randomly observed during conduct of practical sessions in first MBBS particularly in dissection halls. Peer feedback can also be incorporated.

2. **Summative:** Not required

Resources:

https://www.cdc.gov/infectioncontrol/training/infection-control.html.

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Phase II: Module 2

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Module 2.1
Infection Control Practices - Part II

Background:

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The basics of infection and components of the standard precaution have been covered in the first phase. The second phase student is better equipped to understand the details of transmission-based precautions as they now learn about the microbes along with disinfection and antiseptic procedures in detail. This is also the right time to introduce a student to the roles and responsibilities of an Infection Control Team in a hospital.

This module is aimed at enabling the learner to identify the most probable route of spread of a particular microbe causing infection and based upon that, identify which transmission-based precaution need to be adhered to along with standard infection control practices.

Competencies addressed

The student should be able to:	**Level**
Describe and discuss the implementation of airborne and contact precautions in a specific clinical situation	KH
Describe and discuss the functioning of institutional Infection Control Committee	KH

Learning Experience

Year of study: Professional year 2

Hours: 4 hours

I. Interactive discussion – 1 hour
   a. Revisit the various routes of spread of infections
   b. Need for isolation of patients in various circumstances
   c. Airborne and contact precautions including use of PPEs

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d. Disinfection and antisepsis in patient care
e. Roles and responsibilities of infection control team

II. Small group case discussion followed by plenary– 1.5 hours

Example of Case study

Rajani, 34 years has returned home from Italy, at a time when that country is having an epidemic of a new virus infection. She has mild cough and sore throat. When she develops severe breathlessness, she is admitted in the general ward of the hospital. You have been asked to take a detailed history and examine the patient.

- What precautions are necessary in this case?
- What precautions are advised for the subordinate staff attending her?

III. Visit to the isolation ward in the hospital with discussion with the staff about the precautions they take - 1 hour

IV. Debriefing and Feedback - 0.5 hour

Assessment

1. Formative: OSCE, Viva, MCQ can be used.

2. Summative: OSCE, Viva, MCQ

Resources:

https://www.who.int/diseasecontrol_emergencies/training/m4_infection.pdf?ua=1

https://www.cdc.gov/infectioncontrol/training/infection-control.html.

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Module 2.2
Emergence and Re-emergence of microbes

Background:

The serendipitous discovery of Penicillin by Alexander Fleming in 1928 made man dream about victory over microbes, but emerging and re-emerging infectious diseases have proven the futility of that dream and power of the microbes over man.

Emerging Infectious Disease (EID) are diseases that have been newly detected or were found only in restricted geographical locations with few cases. In contrast to this, **Re-Emerging Infectious Diseases** (REID) are diseases that were once major health problems and then their incidence declined to a great extent, but are again becoming health problems for a significant proportion of the population either globally or in a specific geographical location.

Incidence of these Emerging and Re-Emerging infectious diseases is increasing and there are a large number of factors that contribute to the origin or spread of these diseases which can increase the risk of Outbreaks or Pandemics dramatically. These factors can be related to the microbial properties, environmental, socio-economic, and demographic factors. Majority of the EID and REID are Zoonotic in origin and signifies the role of cohabitation in evolution of these organisms.

Keeping in mind the significance of understanding the factors that result in evolution of these infectious diseases and understanding mechanisms that can be adopted for prevention and control of these diseases a sound knowledge, skills and attitudes about Emergence and Re-emergence of microbes need to be developed in undergraduate medical students.

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Competencies addressed:

The student should be able to:	Level
Define emerging and re-emerging infections. Explain reasons or Identify factors responsible for emergence and re-emergence of these infectious diseases.	K
Discuss strategies for early identification, prevention and control of emerging and re-emerging infectious diseases.	K
Discuss the challenges faced in control/ prevention of these infections	KH

Learning Experience

Year of study: Professional year 2

Hours: 6

i. Exploratory and interactive theory session- 1 hour

ii. Self study/ individual/ small group assignment about any one emerging or re-emerging infectious disease – 2 hours

iii. Discussion in small groups about reasons/ factors responsible for emerging or re-emerging infectious disease identified through case studies - 1 hour

iv. Plenary of findings in the case studies and closure - 2 hours

Assessment

1. **Formative:** Required, SAQ, MCQ, Viva Voce
2. **Summative**: Required

Resources:

1. Zumla A, Hui DS, (eds). Emerging and Re-Emerging Infectious Diseases, An Issue of Infectious Disease Clinics of North America E-Book. Elsevier Health Sciences; 2019 Nov 2.
2. Lessler J, Orenstein WA. The Many Faces of Emerging and Re-emerging Infectious Disease. Epidemiologic reviews. 2019 Nov 4.

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Module 2.3
Diagnostic tools

Background:

Diagnostics are a fundamental component of successful outbreak containment or control strategies, being involved at every stage of an outbreak, from initial detection to eventual resolution. Each individual pathogen presents specific diagnostic challenges.

Pandemics are caused by either emergence or re-emergence of microbes. In case of re-emergence, availability of validated diagnostic protocols and tools make laboratory confirmation of the cases easy but this is not the case when we have newly evolved microbes causing pandemic. The laboratory diagnostic tests are either not available and if available, they need to be validated and their performance characteristics like sensitivity, specificity, positive predictive and negative predictive value studied before they can be used for diagnosis. The health care professionals are faced with various dilemmas at these times which can range from a very basic query like the best time and best sample that needs to be collected, to sensitivity and specificity of a chosen procedure that can be isolation of microbes, antigen or antibody detection or gene that needs to be detected in molecular diagnostics.

Thus, the questions are innumerable and it becomes important to train a medical student to deal with such dilemmas in the diagnosis of an infection particularly during pandemics. They must be taught to choose and collect the most appropriate clinical sample in a suitable container with/without transport media, at the most appropriate time from a suspected case during pandemic and interpret the results of the test keeping in mind various performance characteristics and validation requirements.

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Competencies addressed:

The student should be able to:	Level
Describe specimen selection, collection, transportation & storage requirement during a pandemic.	KH
Choose and collect the most appropriate clinical sample in a suitable container at the most appropriate time from a suspected case during pandemic (or in a simulated environment).	SH
Demonstrate appropriate safety measures in handling and processing of clinical specimens (use of PPE etc.)	SH
Discuss various diagnostic modalities available for an infectious disease. Explain sensitivity, specificity, positive predictive value & negative predictive value of each of the diagnostic test/modality.	KH
Chose the most appropriate diagnostic test keeping in mind sensitivity, specificity, positive & negative predictive value of the diagnostic test/modality available.	SH

Learning Experience

Year of study: Professional year II

Hours: 6

i. Exploratory and interactive theory session- 1 hour

ii. Sample collection demo and hand on in skill lab- 1 hour

iii. Visit to laboratory with demonstration of diagnostic test-1hour

iv. Small group activity, where students can be asked to discuss different test reports of suspected cases with performance characteristic and asked to interpret followed by discussion on choosing a lab test– 2 hours

v. Discussion and closure - 1 hour

Assessment

1**. Formative:** Required by assignments, OSPE, viva

2. **Summative:** Required by OSPE, SAQ, MCQ

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Resources:

1. Kelly-Cirino CD, Nkengasong J, Kettler H, et al**.** Importance of diagnostics in epidemic and pandemic preparedness**.** BMJ Global Health 2019;4: e001179.
2. J Michael Miller, Matthew J Binnicker, Sheldon Campbell, Karen C Carroll, Kimberle C Chapin, Peter H Gilligan et al. A Guide to Utilization of the Microbiology Laboratory for Diagnosis of Infectious Diseases: 2018. Update by the Infectious Diseases Society of America and the American Society for Microbiology, *Clinical Infectious Diseases*, Volume 67, Issue 6, 15 September 2018, Pages e1–e94.
3. Washington JA. Principles of Diagnosis. In: Baron S, editor. Medical Microbiology. 4th edition. Galveston (TX): University of Texas Medical Branch at Galveston; 1996. Chapter 10. Available from: https://www.ncbi.nlm.nih.gov/books/NBK8014/.

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Module 2.4

Vaccination strategies including vaccine development & Implementation

Background:

Virulent agent, susceptible host and favourable environment forms the epidemiological triad for all infectious diseases in all settings. The disease can be controlled by addressing any of these components. If available, an effective vaccine can be very useful in breaking the chain of transmission quickly as host will no longer remain susceptible. Given the ease of logistics and quickness of action, vaccine has been looked upon as a potential saviour in situations of epidemics and pandemics especially in diseases caused by viruses. In fact, world owes it to vaccines, for the eradication of Smallpox and control of Polio and Measles. However, the development of vaccines is a long and tedious process, which takes several months to years. Also, equally important is to develop a rational strategy for use of vaccine for any illness. Usually there is undue pressure from communities and administrators for use of vaccines as ad-hoc measure. As a trained medical personnel, the Medical Officer should be able to guide them on this issue sensibly. Also, the Medical Officer should be vigilant to the generalized complacency that follows in the diseases known to have vaccine available. This module will focus on empowering the students to develop sound and rational knowledge about vaccines, vaccine development process and their role in small and large disease outbreaks.

Competencies addressed:

The student should be able to:	**Level**
Describe the process of vaccine development.	KH
Describe the role of vaccines in disease control and eradication.	KH
Describe the steps to prepare a micro plan for vaccination activity at PHC level.	KH
Describe the importance of routine vaccination during pandemics.	KH
Describe the role of communities in vaccination programmes.	KH
Describe the cold chain for vaccine storage and delivery.	KH

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Learning Experience

Year of study: Professional year 2

Hours: 6

i. Exploratory and interactive theory session- 30 min.
ii. Small Group Discussion- 3 hrs.

Suggested Topics for discussion: Vaccines in Disease Control, Vaccine Development Process, Routine Vaccination during Pandemic & Pandemic Influenza Vaccines -WHO.

iii. Visit to PHC/ local hospital to show cold chain and sample micro-planning for Supplementary Polio Vaccination [Interaction with Medical Officer] -2 hrs.
iv. Discussion and closure – 30 min.

Assessment

1. Formative: Required- assignment, MCQ, SAQ

2. Summative: Short Answers, Short Notes

Resources:

1. Pandemic influenza vaccines: WHO. Available from: https://www.who.int/immunization/newsroom/vaccine_PI/en/
2. Vaccine Testing and the Approval Process- Centre for Disease Control, USA. Available from: https://www.cdc.gov/vaccines/basics/test-approve.html
3. Immunization Handbook for Medical Officers. National Health Mission. 2017. https://nhm.gov.in/New_Updates_2018/NHM_Components/Immunization/Guildelines_for_immunization/Immunization_Handbook_for_Medical_Officers%202017.pdf
4. Vaccination in Humanitarian Emergencies: Literature review and case studies. Available from: https://www.who.int/immunization/sage/meetings/2012/april/2_SAGE_WGVHE_SG1__Lit_Review_CaseStudies.pdf

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Module 2.5
Therapeutic strategies including new drug development

Background:

In many pandemics, causative organisms may not be identified in the beginning. Even when identified, it is likely that a specific drug may not be available. However, persons with illnesses will have to be taken care of. This includes general care, supportive care, early recognition and management of complications. Many drugs which are already being used for existing indications may be used as 'off label'. The knowledge of biochemical features, enzymes, receptors, co-receptors, facilitating and inhibiting molecules may help one in postulating and verifying the use of some existing molecules. Considering the major role of immune mediators in disease pathogenesis and that of immunity in the elimination of the organism, various immune-modulators may also be considered in the management at various stages. Some of these molecules may also be used for prophylaxis in exposed persons or for primary prophylaxis in susceptible populations.

The development of a molecule, identifying its effects and detecting toxicities and side effects needs to be done systematically. Before release, any molecule has to undergo phase 1, 2 and 3 trials. Almost always this is done in animals and human volunteers. Post marketing trials also may lead to new observations. However, these steps which generally require long time lags may have to be shortened during a pandemic situation. Many drugs which show good effects may be discarded, as time passes. Experiences with one pandemic in one part of the globe may not be applicable to another. This module helps the learner to understand the pharmacologic approach to a pandemic situation.

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Competencies addressed:

The student should be able to:	Level
Describe and discuss the various phases of drug trials	KH
Prepare a plan for evaluation of off label use of a drug	SH
Organise pharmaco-vigilance activities	SH
Discuss ethical aspects of clinical trials in pandemics	SH

Learning Experience

Year of study: Professional year 2

Hours: 6

i. Exploratory and interactive theory session- 1 hour
ii. Small Group Discussion- 2 hours

Suggested Topics for discussion- New Drug Development – Challenges and Solutions – Urgency in procedures – Need for monitoring.

iii. Visit to a pharmaceutical firm/ pharmacy lab to show various stages of drug development or an ADR monitoring exercise in clinical wards - 2 hours. (since it is not present in many cities - an appropriate video followed by discussion)
iv. Discussion and closure – 1 hour

Case study

1. During the beginning of the Covid-19 epidemic, various drugs were tried in different parts of the globe at various stages of the epidemic. Some of them are off label use of existing drugs, some are extrapolations based on molecular features of the virus. Discuss how you would reach a conclusion and explain to the authorities.
2. There is a pandemic caused by an unknown virus. Someone has come with a claim that a plant extract can be used to prevent and treat this infection.

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Describe and discuss how you will proceed to identify any benefit from such an attempt.

3. A group of persons who have taken a tablet for prevention of infection during a pandemic develops a skin eruption. How will you establish any linkage between the drug and the new manifestation or conclude that this is a new manifestation that is just being recognised.

Learning Points

a. Various phases of clinical trials
b. Compliance with regulatory authorities
c. Exploration of off label uses and new molecules for therapy
d. Pharmaco-vigilance measures.

Assessment

1. **Formative:** SAQ, Viva
2. **Summative:** SAQ, Viva

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Phase III: Part 1

Module 3

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Module 3.1
Outbreak management
including quarantine, isolation, contact tracing

Background

Outbreak management is one of the most important duties for all health care providers concerned with public health. To manage outbreaks, first we must investigate the outbreak to find out answers to what, where, when and who are affected and also as far as possible trace the source which may help us to suggest control measures so that we can contain the outbreak.

Competency addressed

The student should be able to:	Level
Demonstrate the ability to conduct various epidemiological investigation related to pandemics - Level (or in a simulated environment)	SH

Learning experience

Year of study: professional Year 3

1. Introduction of case scenarios (4) -1 hour
2. Self-directed learning -1 hour
3. Interactive Lecture – 1 hour
4. Preparation of epidemic curve, spot map and calculating attack rate from a given data
5. Discussion and closure- 1 hour

Case scenario 1

Mr. X, Medical Officer of a primary health centre noticed increased number of cases with symptoms of fever, sore throat and cough during third week of March. While taking detailed history one patient had a history of international travel 2 weeks back from a place where some of his friends also had similar illness. In the next week, one of the tertiary care hospitals in the city reported increased number of severe acute respiratory illness among admitted patients and two of them died due to this.

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As a Medical Officer or a member of a district health care team, how do you investigate this and manage the situation?

Case scenario 2

Dr. X was appointed as Medical Officer of the Primary Health Centre. One of his field staff reported three cases of watery diarrhoea and dehydration (two mild and one severe) in his field area and he referred them for admission to the hospital.

As a health professional what do you think about this episode and how do we proceed to investigate and control the situation.

Case scenario 3:

Dr. X was on casualty duty that day. Mr. Y, 49 years old, presented to Medicine casualty with high grade fever (3 days), retro-orbital pain, myalgia and rash. While eliciting detailed history from the patient, he revealed that there was history of fever and body ache for his brother and brother's wife one week back for which they took treatment in a private hospital. Mr. Y and his four brothers lived in nearby houses in the same compound (within 300 metres). He took paracetamol on the first two days of fever thinking that he was feverish as he walked in the rain the previous day.

As a health professional what do you think about this episode and how do we proceed to investigate and manage the situation.

Case scenario 4:

Mr. A,17 years old, was brought to Medicine casualty with history of headache, myalgia and vomiting in the past 2 days. He reached home only 4 days back after a tour along with 13 friends. The day after he came home, he had mild fever and body ache. He thought it might be due to tedious travel and took rest at home. But last night his friend phoned him and said that one of their friends was taken to hospital following fever, vomiting and loss of consciousness.

As a health professional what do you think about this episode and how do we proceed to investigate and manage the situation.

Learning Points

a. Define terms: outbreak, epidemic, pandemic.

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b. How to detect / recognise an outbreak- warning signs of an impending outbreak - Steps of outbreak investigation
c. Describing the event in terms of time, place and person and importance of epidemic curve, spot map and attack rate.
d. Responses at different levels – general and specific measures include reservoir control, breaking the chain of transmission and protecting the at-risk group.
e. Differentiate between isolation and quarantine.
f. Role of contact tracing in outbreak control.
g. If it is a new disease, gaps will be there, so to fill the gap research activity is required.

Assessment

1. **Formative:** conducting clinic-social discussion based on a scenario, short answer questions, OSPE response station.
2. **Summative:** modified essay/ short question on steps of outbreak investigation, OSPE response in practical.

Discussion

Definition of an outbreak/ epidemic:

An **outbreak or epidemic** is defined as the occurrence in a community or region of cases of an illness clearly in excess of expected numbers. Usually an outbreak is limited to a small focal area, an epidemic covers large geographic area and has more than one focal point. **Pandemic** is defined as an epidemic occurring world-wide or over a very wide area crossing international boundaries and usually affects a large number of people.

Warning signs of an impending outbreak

- Clustering of cases or deaths in time and /or place,
- Unusual increase in cases or deaths,
- Even a single case of measles, AFP, Cholera, plague, dengue or JE,
- Acute febrile illness of unknown aetiology,
- Occurrence of two or more epidemiologically linked cases of meningitis,
- Shifting age distribution of cases,
- High or sudden increase in vector density,
- Natural disasters.

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Detecting an outbreak

1. **Rumour register:** it has to be maintained in each public health facility for collecting information related to infectious diseases. There are key informants in the community like teachers, Anganwadi workers (AWW), ward members, Self-help Group (SHG), Youth club leaders, etc. They are the eyes and ears of health services in the community
2. Media – an important source of health information
3. Review of routine data
4. Through strict vigilance on warning signs of impending outbreak

Steps of outbreak investigation:

1. **Verification of the diagnosis**: The first and foremost step in outbreak investigation would be to verify the diagnosis. A clinical examination along with laboratory investigations of a sample of cases may be sufficient for this, but the epidemiological investigation should not be delayed until laboratory results are available.
2. **Confirmation of existence of an outbreak**: For this, Medical Officer should check
    - If there is an abnormal increase in the number of cases, or
    - See there is clustering of cases, or
    - If the cases are epidemiologically linked, or
    - If some trigger events have occurred, or
    - If many deaths have occurred.

An arbitrary limit of two standard errors from the endemic occurrence is used to define epidemic threshold for common diseases like influenza. If there is evidence of an outbreak, and if the aetiology, source and route of transmission are known, specific control measures need to be initiated immediately. If anyone of the above is unknown, the outbreak must be investigated to identify the specific cause. The Rapid Response Team (RRT) which was formed during the phase of epidemic preparedness should be alerted and requested to further

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investigate the outbreak. At the same time general control measures should be started.

3. **Defining population at risk:** before starting investigation, it is necessary to have the attack rates.
4. **Rapid search area map and age gender distribution of entire population in the area.** This is essential for calculating for all cases and their characteristics: this is to identify all cases including those who have not sought medical care and those possibly exposed to the risk.

   For this, we can use a carefully designed epidemiological case sheet. The information collected should be relevant to the disease under study. Based on the information collected from the affected ones, search for more cases and their contacts should be continued. Laboratory investigations are done with the help of microbiologist. Microbiologist may advise on what samples are required, mode of collection and transport and also the laboratory to which these are to be sent. Entomological investigation should also be done if the outbreak warrants it.

5. **Data Analysis:** Data collected should be analysed to identify common event or experience using the epidemiological parameters like time, place and person.
   Time: Epidemic curve can be constructed based on chronological distribution of dates of onset and number of cases. It may suggest a time relationship with exposure to a suspected source, whether it is a common source or propagated epidemic, whether it is of a seasonal or cyclic pattern.
   Place: A spot map is prepared with cases in relation to possible source of infection. Clustering may suggest common source of infection.
   Person: Analyse the data by age, sex, occupation, and other risk factors. Find out attack rates/ case fatality rates for those exposed and not exposed. In food borne epidemic, food specific attack rates are calculated.

6. **Formulation of hypothesis:** on the basis of time, place and person analysis, hypothesis is formulated to explain the epidemic in terms of possible source, causative agent, possible modes of spread, people at risk and the environmental factors

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7. **Testing the hypothesis:** If the hypothesis fits with the facts, response measures can be initiated; otherwise, further analytical investigation in terms of case control studies will need to be carried out. In the meantime, general control measures are carried out.
8. **Evaluation of ecologic factors:** This is to prevent further transmission of disease. Ecologic factors include sanitary status of eating establishments, water and milk supply, break down in water supply, population movements, atmospheric changes, population dynamics of insects and animal reservoirs.
9. **Further investigation of population at risk**: To obtain additional information, for e.g. serological study may reveal clinically in-apparent cases and throw light on the pathogenesis of the condition.
10. **Writing the report:** This can be an interim report which includes details of the investigation, the diagnosis and control measures initiated. Once the outbreak is coming under control, we should make follow up visits to see whether control measures are implemented adequately and also help to collect new information which was missed in the previous visits. The final report is given within 10 days of the outbreak being declared to be over. The outbreak is declared over when there are no new cases for a period of two incubation period since the onset of last case.

Responses to an outbreak

1. **General measures is** till the specific source and route of transmission is identified. For example, if one is suspecting a droplet infection outbreak, start a campaign requesting people to follow social distancing, use of mask and hand hygiene.
2. **Specific measures** depend on the causative agent. The broad steps are:
    - Identification and nullification of the source of outbreak like chlorinating wells,
    - Minimising transmission to prevent further exposure: vector control,
    - Protection of the host- immunization / chemoprophylaxis,
    - Controlling the reservoir include early diagnosis, notification, isolation, treatment, quarantine.

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Isolation: Separation **of infected** persons or animals **for the period of communicability** from others in such places and conditions as to prevent or limit the direct or indirect transmission of infectious agent from those infected to those who are susceptible. Purpose is to protect the community by preventing transfer of infection from the reservoir to the possible susceptible host.

Quarantine: Limitation of freedom of movement **of healthy person** or domestic animals exposed to communicable disease for **a period not longer than the longest usual incubation period** of the disease to prevent contact with those not so exposed.

Contact tracing: The process of identifying, assessing and managing people who have been exposed to a disease to prevent onward transmission. When systematically applied, this will break the chain of transmission of an infectious disease and is an effective tool in public health. This has to be explained according to the scenario provided.

Resources:

1. Park's Textbook of Preventive and social medicine - 25th edition-published by Banarasidas Bhanot-2019.
2. Medical officer's manual on Integrated Disease Surveillance Project by National institute of Communicable Diseases, DGHS, GOI 2006.

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Module 3.2

Interdisciplinary collaboration, Principles of Public Health Administration, Health Economics

Background:

When an outbreak is suspected as given in the case scenarios of previous module, interdisciplinary collaboration is essential. Inter-sectoral coordination is one among the four principles of primary health care. To ensure this, the outbreak control team or multidisciplinary team is convened to conduct the investigation in the field for confirming the outbreak and taking measures for preventing the spread of disease. The powerful public health administration which aims equity, use of appropriate technology, community participation and inter-sectoral coordination is our strength. While managing an outbreak we would understand that many of the determinants of health lie outside the domain of Health Department. Provision of safe drinking water, sanitation, nutrition, legal measures for imposing strict interventions, good house and shelter are some examples. This also points towards the importance of interdisciplinary collaboration. Members of the community should have all the rights to participate in their duties towards controlling an outbreak.

Competency addressed

The student should be able to:	Level
Demonstrate the ability to conduct various epidemiological investigation related to pandemics (need clarity on simulated environment).	SH

Sub competency

Demonstrate the ability to form interdisciplinary team for conducting outbreak investigation.

Learning objectives

The learners should be able to:

1. List the four principles of primary healthcare,

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2. Describe the scope of inter-sectoral coordination in outbreak control,
3. List the members of inter-sectoral team for outbreak investigation,
4. Describe the activities of inter-sectoral team in each case scenario provided,
5. Demonstrate the formation and meeting of Rapid Response Team (RRT) as role play according to the case scenarios.

Learning experience

Year of study: professional Year 3

1. Introduction of topic based on previous case scenario -1 hour
2. Self -directed learning -1 hour
3. Interactive Lecture – 1 hour
4. Role play on forming RRT- 1 hour (based on one case scenario)
4. Discussion and closure- 1 hour

Learning Points

a. Inter-sectoral coordination as one among the four principles of primary health care,
b. The role of inter-sectoral coordination in outbreak management,
c. How this can be applied in all four case scenarios,
d. Who are included in the outbreak investigation team and what are their roles and responsibilities?
e. What is health economics? What is the impact of epidemic/pandemic on economic status of the family/ state/country?
f. Cost effectiveness of interventions/ actions to control epidemic.

Assessment

1. **Formative**: theory examination -as short questions /practical – group viva voce.
2. **Summative**: modified essay/ short question on role of inter-sectoral coordination in epidemic management, practical - viva voce.

Discussion points

Inter-sectoral coordination: It is a fact that health care cannot be provided by the health sector alone. While managing outbreak we realise that many of the determinants

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of health are outside the domain of health care. Hence inter-sectoral coordination as one among the four principles of primary health care is worth mentioning. The other areas closely related to health are agriculture, animal husbandry, food, industry, education, housing, public works, communication etc. To ensure such coordination, administrative system should take the lead with suitable legislation and strong political will. Proper planning should be there to avoid duplication of activities.

In the event of a suspected outbreak, the Rapid Response Teams (RRT) which is a multidisciplinary team that looks into various aspects of an outbreak is alerted and meeting is convened. The team includes an epidemiologist, clinician, microbiologist and other specialities and sectors as per requirements (described earlier). The main role of RRT will be to investigate and confirm outbreak. The members of RRT are regularly doing their work but, in the event of an outbreak, come together to undertake a special function. They should work in coordination with the Government health staff. They will help and support health staff in management and control of outbreak but the responsibility of implementing control measures mainly rests with local health staff. RRT should be formed at all levels of administrative system (district, block, Panchayath). The name, address and mobile phone number of RRT members should be available at respective levels so that they can be alerted as soon as possible.

Health economics: Health economics as a branch of economics, is concerned with issues related to efficiency, effectiveness, values and behaviour in the production and consumption of health and health care. Pandemics may affect a large population across borders and nobody can predict when it ends, especially if it is a new disease without vaccine or treatment. So, we are forced to implement other measures like isolation, quarantine and complete lock-down to save the lives of the people. But, at the same time globally we have to face economic crisis due to reduction in gross domestic product (GDP) due to loss of life, workplace closures and quarantine measures.

Economic evaluation can be done as the comparative analysis of alternative course of action in terms of both their cost and consequences. Methods can be cost-benefit analysis (in monetary terms) and cost-effective analysis (in natural units).

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The Epidemic Diseases Act, 1897 (ANNEXURE I)

One of the shortest legislations in India, The Epidemic Diseases Act has four sections. It is aimed at 'providing for better prevention of the spread of Dangerous Epidemic Diseases'. The Act was first enacted in the British colonial era primarily to control the Bubonic Plague outbreak in the late 1800s. It has remained relevant ever since.

Section 2A of the Act allows the Centre to prescribe regulations to inspect any ship or vessel leaving or arriving in any port and to detain any person planning to leave or arrive into India.

The Government's decisions on restricting international and domestic travel to and from India fall under the provisions of this Act.

The Act also empowers State Governments under Section 2(1) to prescribe Regulations with respect to any person or group of people to contain the spread of Covid-19.

Penalty

Section 3 of the Epidemic Diseases Act, 1897 gives the penalties for violating the Regulations. Section 188 of the Indian Penal Code states that it will be six months imprisonment or Rs. 1000 fine or both.

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The Disaster Management Act, 2005 (ANNEXURE II)

The Disaster Management Act was enacted to tackle disasters at both Central and State Government levels.

Section (2) defines a disaster as a "catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man-made causes". **On March 14, 2020 the Central Government termed Covid- 19 as a 'notified disaster' as a "critical medical condition or pandemic situation".**

The Act enables the Centre and States to enforce a lock-down and restrict public movement. It allows the Government to get access to the National Disaster Response Fund, the State Disaster Response Fund and the District Disaster Response Fund. It also has provisions for allocation of resources for prevention, mitigation, capacity building etc.

The Penalties

Sections 51 to 60 of the Act prescribes the penalties for the violators.

The Law describes the offence as obstructing any officer or employee from performing their duty or refusing to comply with directions. Violators can be jailed for up to 1 year or fine, or both. In the case of dangerous behaviour, the jail term can be extended to two years.

Resources:

1. Park's Textbook of Preventive and social medicine - 25th edition: published by Banarasidas Bhanot -2019.
2. Medical officer's manual on Integrated Disease Surveillance Project by National Institute of Communicable Diseases, DGHS, GOI 2006.

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Module 3. 3:
Operational research, field work, surveillance

Background

Operational research is the discipline that uses statistics, mathematics, computer modelling and similar science models for decision making. It is a potential tool for use in many areas that demands evidence-based or model-based decision making. One such area is the epidemic/ pandemic management but it is used less frequently. The reason for its limited use may be because of low awareness among the specialist community. In the era of frequent epidemics, it is the need of the hour to sensitize undergraduate medical students of today (health professionals of tomorrow) about operational research and its use in epidemic management.

Another important area is surveillance which is the backbone of public health programmes and provides information on public health events so that effective action can be taken in controlling and preventing disease outbreaks. The course of an epidemic depends on how early it is identified and how effectively specific control measures are applied.

Competency addressed

The student should be able to:	Level
Demonstrate the ability to conduct various epidemiological investigation related to pandemic (or in simulated environment)	SH

Sub-competencies addressed

1. Demonstrate the ability to appreciate the need of operational research in epidemic control.
2. Demonstrate the ability to identify syndromes and underlying diseases in the given scenario and suggest control measures.

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Learning experience

Year of study: professional Year 3

1. Introduction of topics based on previous case scenario -1 hour
2. Self –directed learning -1 hour
3. Interactive Lecture – 2 hours (surveillance, operational research)
4. Discussion and closure- 1 hour
5. Visit to PHC/sub-centre and field area along with field staff of sub-centre -3 hours

Points to be discussed

a. What is operational research?
b. The role of operational research in outbreak management,
c. How this can be applied in all four case scenarios,
d. What is public health surveillance, its key elements and uses of surveillance in outbreak prevention,
e. Integrated Disease Surveillance Project (IDSP) – syndromes and core conditions in IDSP, types of surveillance, data collection methods,
f. How surveillance activity is carried out in peripheral institution (SC/PHC) as per IDSP
g. What are the field activities and how data is collected, compiled, analysed and reported?

Assessment

1. **Formative:** theory examination –as short questions /practical – viva voce
2. **Summative**– modified essay/ short question on role of operational research in epidemic management, Public Health Surveillance, practical – viva voce.

Discussion points

Operational research (OR): is the discipline that uses statistics, mathematics, computer modelling and similar science methodology for decision making. This is helpful in many areas especially outbreak management activity that requires evidence-based or model-based decision making. Operational research can address important issues in epidemic management like how to allocate resources among options for a

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better control of epidemic, what resources are needed to control an outbreak and which resources should be employed for the same.

Analytical computer-based models are used for plotting and forecasting epidemics. Advanced models with quantitative analysis are used for quantifying exposure and forecasting resources needed. Decision making techniques are used to help policy makers to set up policies. It is again a multi-disciplinary approach which requires team activity of OR/ statistics researchers, epidemiologist, managers, physicians, microbiologists etc. which help staff dealing with Statistics to better understand the nature of the epidemic and that is reflected in predictive accuracy of models. At the same time, epidemiologists will be more involved in OR and modelling which help them to better manage outbreaks.

Public health surveillance: Surveillance is defined as ongoing systematic collection, collation, analysis and interpretation of data and dissemination of information to those who need to know in order that action can be taken. In simple words, it is a data collection for action. We already have a system of decentralized state-based surveillance program in the country named as **Integrated Disease Surveillance Project (IDSP)**. This is the back bone of public health program as it provides information so that timely action can be taken in controlling and preventing diseases/ outbreaks.

Key elements of surveillance system are:

- Detection and notification of health event,
- Investigation and confirmation (epidemiological, clinical, laboratory),
- Collection of data,
- Analysis and interpretation of data,
- Feedback and dissemination of results,
- Response – a link to public health program as action for prevention and control

Uses of surveillance in outbreak control and prevention:

- Recognize cases or cluster of cases to trigger interventions to prevent transmission or reduce morbidity and mortality,

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- Identify high risk groups or geographical areas to target interventions and guide analytic studies,
- Demonstrate the need for public health intervention programs and resource allocation during public health planning,
- Monitor effectiveness of prevention and control measures.

Core conditions under surveillance:

- Regular surveillance: vector borne diseases, water borne diseases, Respiratory diseases, vaccine preventable diseases, disease/s under eradication, other conditions (RTA), international commitments, Unusual clinical syndromes.
- Sentinel surveillance: Sexually transmitted disease/ blood borne, other conditions (water quality, outdoor air quality.
- Regular periodic surveillance: NCD risk factors, State specific diseases (Dengue, JE, Leptospirosis).

Types of surveillance in IDSP

Syndromic: Diagnosis made on the basis of symptoms/ clinical pattern by paramedical personnel and members of the community.

Presumptive: Diagnosis made on typical history and clinical examination by Medical Officer.

Confirmed: Clinical diagnosis confirmed by laboratory test.

Major syndromes and (conditions) given under IDSP

- Acute watery diarrhoea – (Cholera),
- Fever <7 days duration- only fever (malaria), fever with rash (Measles/Dengue), altered consciousness (Japanese encephalitis), fever with bleeding (Dengue), with convulsions,
- Fever > 7 days– (Typhoid),
- Jaundice- (Hepatitis),
- Cough >3 weeks,- (Pulmonary Tuberculosis),
- Acute flaccid paralysis - (Poliomyelitis),
- Unusual event?

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Data collection methods

- Routine reporting – passive surveillance
- Sentinel surveillance
- Active surveillance
- Laboratory surveillance
- Outbreak investigation

PHC / sub-centre visit– interacting with Medical Officers of PHC and field staff about surveillance activities going on there as part of IDSP. Also getting acquainted with different registers and reporting formats for all three types of surveillance (syndromic, presumptive, Laboratory).

Field area visits with field staff to acquire skills of data collection methods, recording, analysing and reporting.

Resources:

1. Park's Textbook of Preventive and social medicine - 25th edition published by Banarasidas Bhanot-2019.
2. Medical Officer's Manual on Integrated Disease Surveillance Project by National Institute of Communicable Diseases, DGHS, GOI 2006.

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Phase III: Part 2

Module 4

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Module 4.1
Care of patients during Pandemics

Description:

During any pandemic, infected persons can be divided into three categories. Asymptomatic persons, mildly symptomatic, Advanced disease. Epidemiologically all symptomatics can also be classified as suspected, probable and confirmed. Most infected persons in most infections tend to be asymptomatic but infective to others. They are usually not picked up unless there is substantial active surveillance mechanisms in place. If all contacts are kept under observation or in quarantine and they are regularly screened, the asymptomatic persons can be picked up in large numbers.

The patients who come to the hospital are mostly symptomatic. Some of them may be serious enough to be hospitalised and some may need intensive care. They are usually graded as mild, moderate and severe, based on clinical finding and prognosis. The progression from mild to moderate and severe will depend on many factors.

The Institutional approach to a person reaching the health system includes proper triaging with the purpose of recognising and restricting the potential for transmission of infection to others, recognising bad prognostic signs and early institution of care depending on the presentation. All health care workers at the triage point should be aware of the specific information that needs to be elicited (e.g. travel history) and the bad prognostic indicators (symptoms and signs). In many illnesses, contact / airborne precautions must be initiated in the triage area itself and unnecessary movement of patients and close associates must be restricted too.

The clinical management of patients during pandemics must be based on specific protocols/ guidelines from immediate higher authority. This should be evidence-based and as per standard practices recognised. Extreme care should be taken to

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document all history and other epidemiologic evidences, however subtle they may be. All activities should be properly documented and communicated to higher authorities as required. The treatment can be divided into non-pharmacologic interventions (like isolation, nutritional support), supportive care, specific management (if any), recognition and management of complications and prevention.

Competencies addressed

The student should be able to:	**Level**
Describe and discuss the triage facilities required for persons during epidemics	KH
Demonstrate the role of IMG in triage and referral	SH
Demonstrate the ability to manage a suspected / confirmed case in the emergency room during a pandemic	SH

Case study

There is some news about an unknown disease spreading in the town. An ambulance stops in front of your clinic. A group of 05 persons immediately jump out and rush to transport the patient to the emergency room. Mrs. Gracy, 65 years suffering from cough and breathlessness, is carried by four persons to the clinic. One among the group of doctors examines the patient and requests the nurse to arrange for a Chest X-ray and Blood Glucose estimation. Another doctor records the blood pressure. A third person tries to do a venesection. The patient is sent to the Radiology department. The patient develops breathlessness and syncope while returning to the emergency room.

- How should the emergency room prepare to receive a suspect case during an emergency?
- How can such a situation be handled better and safely during an outbreak?
- What precautions should be taken while patient is transported during an outbreak?

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Learning Points

- Principles of Triage during epidemics,
- Precautions and care to be made while transporting a person with infections,
- Responsibility to other health care workers while a person with infection is cared.

Learning Experience

Year of study: Professional year Phase III Part 2

Hours: 6 hours

a) Interactive discussion – 2 hours
   i. Triage practices to be followed in a clinic / hospital
   ii. Primary care to be given to a patient on reaching the hospital
   iii. Steps to be taken to reduce transmission of infections in emergency area.

b) Role play to highlight the various roles to be played in emergency area - 1 hour
c) Visit to the hospital with discussion with staff about the practices followed - 2 hours
d) Debriefing and Feedback - 1hour

Assessment

1. **Formative:** DOPS, Viva can be used. This could be done immediately after the module and/or later with internal assessment.
2. **Summative:** not required

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Module 4.2
Emergency Procedures during Pandemics

Description:

During outbreaks of illnesses, many patients can develop life-threatening complications. This is more common among persons of extreme age (children and elderly), depending on the pathogen. It is also likely to be more common among persons with co-morbidities as well. These co-morbidities may also make them vulnerable to dangerous events. Toxin or cytokine-mediated damage, metabolic causes, coagulation abnormalities, sepsis etc. can cause multi-organ dysfunction quickly. Persons may develop respiratory, cardiac, renal or neurological events. Proper and timely intervention can prevent further deterioration or even reverse the situation. The IMG should demonstrate required competencies to perform certain procedures. These may include endotracheal intubation, ventilation, cardiopulmonary resuscitation, tracheostomy, to name a few. All situations demand extreme care to be adopted to protect the health care worker involved in such procedures as well. Beyond the skills that are necessary to perform these psychomotor procedures, the IMG should also have the knowledge, attitude and communication skills to manage such a situation.

Competencies addressed

The student should be able to:	**Level**
Demonstrate the ability to perform life-saving interventions during outbreaks, ensuring safety of HCWs	SH

Case study

Mr. Joseph, 72 years old, has been admitted with a febrile illness, one week after a foreign trip at a time when a pandemic had been declared in the country he visited. He is being managed in an isolation room with all airborne precautions. The nurse notices that he has suddenly developed breathlessness and is tachypnoeic. The

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oxygen saturation by pulse oximetry is only 70%. The duty doctor has found crackles all over the lung fields and mild cyanosis. The relatives are planning to take him home on their own. The doctor is called in by an emergency call.

- What are the steps that can be taken immediately to ensure a better survival for him?
- What are the factors influencing the decision to do any invasive procedure?
- How will you discuss the issues with the relatives?

Learning points

1. The type of emergency procedures required in various emergencies,
2. The logistics and infrastructure facilities and prioritisation to be considered,
3. The aspects related to communication with the relatives,
4. The immediate, short-term and long-term care of such persons in Intensive care.

Learning Experience

Year of study: Professional year Phase III Part 2

Hours: 8 hours

I. Interactive Discussion – 2 hours
    1. Indications for invasive procedures in Pandemics
    2. Points to be verified before emergency procedures
    3. Steps to be taken to reduce transmission of infections
    4. Attitude and Communication Issues related to complicated procedures

II. Skill development program – with mannequins e.g. intubation, CPR, ALS, PALS etc - 4 hours *(This may be linked with the routine Skill training component as well)*

III. Role Plays for communication skills and documentation - 1 hour

IV. Debriefing and Feedback -1hour

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Assessment

1. **Formative:** OSCE, DOPS, Viva can be used. This could be done immediately after the module and/or later with internal assessment
2. **Summative:** OSCE, Viva, SAQ, MCQ

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Module 4.3
Managing Death during Pandemics

Description:

During outbreaks of illnesses, many patients may expire, due to various causes. This is more common among persons of extreme ages (children and elderly) depending on the pathogen. It is also likely to be more common among persons with co-morbidities as well. These co-morbidities may also make them vulnerable to death as well. The inevitable consequence of death during pandemics must be handled with extreme caution. The management may start from the time the person becomes sick or is brought in a moribund condition. Death may be unexpected or even expected at times. Many procedures discussed in the previous module may not help in preventing death. Breaking the bad news regarding the condition of the patient well in time may ease the handling of death related issues. Documentation of death in as much clear terms as possible is absolutely essential. Handling of the dead body adhering to the infection control recommendations is also very important. Cooperation from relatives and administration has to be ensured, depending on the situation. The IMG is expected to be well aware of the medical and social consequences of death during a pandemic. Beyond the skills that are necessary to perform these procedures, the IMG should also have the knowledge, attitude and communication skills to manage such a situation.

Competencies addressed

The student should be able to:	**Level**
Demonstrate the ability to handle death related events during outbreaks	SH

Case study

Mr. Abdul, 50 years old, has been admitted with a febrile illness, which he developed after staying with his son who recently came from a metropolitan city where an unknown disease had been declared. He was intubated and was on ventilator for two

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days. He was being managed in an isolation room with all airborne precautions. He was showing signs of improvement when he suddenly became unconscious and stopped breathing. Cardio-pulmonary resuscitation was attempted but failed. He died about 15 minutes after he developed the symptoms in the ICU. The doctor declared that he is no more.

- How is the event discussed with the relatives?
- What documents are to be prepared regarding the event?
- What care has to be exercised to prevent the transmission of infection after death?
- How will you discuss the issues with the relatives?

Learning points

- The emotional issues for the relatives and HCWs related to death of a person during epidemics.
- The principles of documentation and reporting and legal and ethical issues of death during epidemics.
- The aspects related to infection control practices like prophylaxis (if any), disinfection etc.

Learning Experience

Year of study: Professional year Phase III Part 2

Hours: 2 hours

i. Interactive discussion – 1 hour
   a. Confirmation and documentation of death
   b. Steps to be taken to reduce transmission of infections
   c. Attitude and Communication Issues related to handling of dead bodies
   d. Responding to media

ii. Role Play for communication skills and documentation with debriefing and feedback - 1 hour

Assessment

1. **Formative:** Viva can be used. This could be done immediately after the module and/or later with internal assessment.
2. **Summative:** Viva, SAQ, MCQ

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Module 4.4
Information Management during Pandemics

Description:

During the spread of any infection, the community reacts in a certain fashion. Initially there will be fear of spread, maligning the affected people, stigma and discrimination and panic. The media also plays with this and try to sensationalise the whole issue. Any variations from normal pattern of response and functioning of HCWs will be criticised and negative messages will be generated. The media, when well informed, can help a lot in public awareness, health education and behaviour change. It depends to a large extent in sharing the proper information with them at the right time. The sanctity of the media and the right of society to criticise must also be respected.

The social media gets flooded with messages related to outbreaks very early. Most of these messages are based on inadequate information and improper interpretation of the unscientific ideas. Unfortunately, most of the knowledge that is shared in the social media is neither verified nor controlled by anyone. At the same time the online social media is an effective tool for spreading the right messages.

In many epidemics, contact precautions are to be adopted by HCWs and the general public. The visit to the hospital could contribute significantly to spread of infections. In many infections, home or institutional quarantine may be in place. These persons may develop many illnesses and other problems that do not require a face to face consultation. In such instances, the authorities have opened up the avenue of Telemedicine as a viable alternative. History taking and to some extent visual examination of the patient can be done using common virtual platforms. More exploratory options are available using sophisticated instruments like electronic stethoscope, portable ultrasound etc. Counselling is another activity that can use this platform. Online prescriptions in standardised format is also being accepted now. The IMG should be aware of the clinical, emotional, social and legal issues associated with this form of medical practice. Familiarity with electronic medical records, referral

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patterns, virtual documentation etc. is also desirable. The virtual platform is also useful for health education and formal teaching and training for students and HCWs.

Competencies addressed:

The student should be able to:	**Level**
Demonstrate the ability to prepare media reports, use online communication	SH
Demonstrate the ability to handle media communication and education	SH
Demonstrate the ability to recognise spam & fake messages	SH

Case study 1

Mrs. Rachel, 30 years old, has been admitted with a febrile illness, 4 days after attending a funeral attended by many persons from outside the country. She became sick and was intubated in the emergency room. There was some delay in transferring the patient to intensive care unit. Within a few minutes, a few cameramen from visual media reached the campus and started reporting alleged deficiencies in care. Messages with similar content also started appearing in the social media. It was argued that the delay was because a very fatal infection was suspected in the patient and HCWs were refusing to see the patient. It was also suggested that this disease is spreading fast, is lethal and no cure is available.

- As the Medical Officer on duty on that particular day, you are asked to comment on what went wrong?
- You have been requested by your friends to start a messaging series countering the text messages appearing in the social media. What steps are recommended?
- How will you create a proper message for the visual media and social messaging platform?
- How can you develop a Tele-consultation system in your practice?

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Learning points

- The chance of even small variations in the working of hospitals getting media attention
- The irresponsible behaviour from many corners of the society
- The need to prevent fake messages and to spread correct information.
- The proper use of Telemedicine for clinical and academic work.

Learning Experience

Year of study: Professional year Phase III Part 2

Hours: 4 hours

i. Interactive discussion - 2 hours
   a. Responding to media
   b. Use and misuse of social media for health related messages.

ii. Visit to the media centre / Tele Medicine unit - 1 hour

iii. Role Plays for responding to media with Debriefing and Feedback - 1 hour

Assessment

1. **Formative:** Viva can be used. This could be done immediately after the module and/or later with internal assessment
2. **Summative:** Not needed

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Module 4.5
Intensive Care Management during Pandemics

Description:

Pandemics become important, when there is a high degree of morbidity and associated mortality. This usually happens to persons at extremes of age. The elderly are highly vulnerable due to the aging process and compromised system functions and also because of many co-morbidities. Children and infants suffer mainly because of lack of immunity and higher chances of mingling and other issues like malnutrition. However, this pattern may get altered due to various reasons. The working population constituted by the young and middle aged can be affected in epidemics with direct links to the environment – ecological and employment related: e.g. Leptospirosis, Dengue, Chikungunya etc. Gender variations can also happen due to various predisposing factors among any gender groups. Serious involvement of organs systems like respiratory, cardiac, nervous or renal can lead to rapid deterioration in the patient's condition which may require extra care with lot of support and monitoring.

Intensive care is specialised care given in specialised settings with regular monitoring and corrective measures instituted without delay by a team of trained health care workers. The Intensive Care Unit (ICU) of today works with lots of gadgets and standard protocols. In addition to the technical details about diagnosis, prognostication and management, the team care concept and management of affective and communication issues related to ICU care also has to be imbibed by the learner. This form of care is usually very expensive and adds to the financial burden of the family as well. Maintenance of a good ICU demands the use of lots of technology, behaviour change, attitudinal modifications and team skills.

The routine intensive care that is offered for management of pandemic related cases also needs special training, as this involves high levels of integrity, dedication and commitment in terms of effort, compassion and a sense of urgency. This is also compounded by the fact that there are epidemiological issues as well.

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This module intends to give the learner an insight into the intricacies of intensive care during the pandemics.

Competencies addressed:

The student should be able to:	**Level**
Visit, enumerate and describe the functions of an Intensive Care Unit	KH
Enumerate and describe the criteria for admission and discharge of a patient to an ICU	KH
Observe and describe the management of an unconscious patient	KH
Observe and describe the basic setup process of a ventilator	KH
Observe and describe the principles of monitoring in an ICU	KH

Case study

55 year old Krishnan, known case of systemic hypertension and type 2 diabetes mellitus presented with cough and breathing difficulty in the last 3 days. Patient was diagnosed with Covid-19 infection. Patient was referred to Covid isolation ICU in view of severe breathing difficulty, tachypnoea and desaturation. Patient was transported to ICU in oxygen trolley with O_2 via simple face mask considering all Covid-19 precautions.

Monitors were attached. On examination, patient conscious, oriented, tachypnoeic, Pulse Rate -120/min, BP-128/72mmHg, RR-32/min. ABG showed respiratory alkalosis with PaO2/FiO2 = 138(moderate ARDS). Initial CURB 60 score was 2. Patient was put on High Frequency Nasal Cannula (HFNC) with flow rate of 40L/min and FiO2 of 90%. Routine investigations were sent which includes CBC, ESR, RFT, LFT, serum electrolytes, coagulation profile, viral markers, blood grouping. Prognostic markers were done : CRP > 100 mg/L, LDH – 600 units/L, Trop I - <2.5 ng/L, D dimer – 1400 ng/ml, Serum ferritin – 565 ng/ml. Chest X-ray showed bilateral chest infiltrates. ECG showed normal sinus rhythm.

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As the doctor on duty on that particular day, you are asked to plan future management.

Learning points

1. Initial assessment of patient in ICU
2. Early stabilisation of patient
3. Prognostication and management using standard protocols
4. Coordination with doctors and paramedical staff
5. Communication with the bystanders
6. Reporting to higher authorities

Learning Experience

Year of study: Professional year Phase III Part 2

Hours: 4 hours

i. Interactive Discussion – 1 hour
   a. Interactive Lecture with videos

ii. Visit to the ICU – 1 hour
   a. Infection control
   b. Monitoring of vital signs
   c. Interpreting investigations
   d. Monitoring using equipment

iii. Role Play – 1 hour

iv. Debriefing session by intensivist - 1 hour

Points for Discussion

INITIAL STABILISATION OF PATIENT IN ICU

When a patient is received in ICU,

1. Make sure that the below said equipments are available:
   a. Oxygen source
   b. Airway cart
   c. Working suction
   d. Monitors

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e. Emergency drugs
f. Defibrillator

2. Attach monitors
3. The primary survey should follow A-B-C-D-E

A- Airway

- If the patient can speak, the airway is patent
- Airway patency not maintained, triple manoeuvre-head tilt, chin lift and jaw thrust.
- If still not maintained, use oropharyngeal/nasal airways.

B- Breathing

- Check for oxygen saturation and respiratory rate
- If SpO2<90% and RR>30---give oxygen supplementation via
    a) Nasal prongs
    b) Simple face mask
    c) Venturie face mask

C- Circulation

- SBP<90—check distal pulses, confirm IV access and give fluid bolus
- Start on inotropic support

D - Determine GCS and assess pupils

E- Examine the patient

4. **Inform superior officer**

Assessment

1. **Formative:** Pre-test – Post Test; Viva can be used. This could be done immediately after the module and/or later with internal assessment.
2. **Summative:** Case based short note with plan of management, MCQ

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Module 4.6
Palliative Care during Pandemics

Description:

During pandemics and other periods, many patients are likely to develop long lasting consequences after acute illness. After intensive care, a stage may be reached, when patients do not require to be in major institutions or need regular therapeutic procedures. Such persons require long-term care with social support systems. They may require only supportive, curative and rehabilitative interventions. The care is also aimed at making life comfortable and pleasant for them in the future. The patient may or may not recover, but giving hope for a better tomorrow may help them cope with the illness.

Palliative care is a broad speciality with plenty of activities. This module aims to familiarise the learner with the concept of palliative care.

This module may also be used to discuss about the issues related to isolation and solitude by the patients and also about the unhealthy stigma and discrimination experienced by patients, relatives and colleagues. Points may be raised about the issues faced by Health Care Workers, their emotional issues, burn out etc. as well. Social issues related to restriction of activities may be also be discussed along with this module.

Competencies addressed:

The student should be able to:	**Level**
Demonstrate an understanding and needs and preferences of patients when choosing curative and palliative therapy.	KH

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Case study

James, 38 year old salesman, developed a febrile illness He was tested positive for a new viral infection. He developed shock while on treatment. He was started on inotropic supports, catheterised, was shifted with O_2 via simple face mask.

In CCU, on day 2 patient developed fever, GCS was E3VTM4, oliguria. Investigations revealed increased total count, increase in CRP, thrombocytopenia, altered RFT. ABG showed high anion gap metabolic acidosis. Patient developed sepsis with Acute Kidney Injury and Renal Replacement Therapy was initiated. Post dialysis patient was on double inotropic (noradrenaline and vasopressin) supports.

Post op day 4, GCS was E2VTM3, anisocoria present, investigations revealed haemoglobin - 9g/dl, total count – 20,000, platelet count – 60,000, urea/creatinine – 90/3, potassium – 5.2, altered LFT and coagulopathy. CT brain was taken which showed large right tempero-parietal bleed with IVH and midline shift. Since the patient was in septic shock with multi-organ dysfunction and DIC, it was decided for conservative line of management. Intensivist decided to discuss about palliative care with the family.

“I am Dr. , I am the treating physician of your son. I am here to explain the health condition of your son. As you know your son now has multi-organ failure. He has widespread blood stream infection which has affected his multiple organs. His vitals are unstable and is on multiple inotropic supports. He developed a condition called DIC and as a result there is large bleeding in his brain. In this situation, surgery would offer no benefit. It might further worsen his condition. Now, his vitals are only maintained with so much medications and ventilatory support. Any therapy aiming to improve his clinical condition will be futile. We are anticipating a gradual clinical deterioration which might end up in his death. So, we would suggest a palliative comfort care for this patient with your consent.

Learning points

1. Need to assess a patient well before palliative care is suggested
2. Importance of planning palliative care

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3. Communicating to the patients and relatives about the need and utility of planned palliative care

Learning Experience

Year of study: Professional year Phase III Part 2

Hours: 4 hours

i. Interactive discussion – 1 hour
   a. Interactive Lecture with videos

ii. Visit to the palliative care unit – 1 hour
   a. Pain & palliation
   b. Educational activities regarding continuation of care and warning signs
   c. Monitoring using basic observations and examinations
   d. Nutritional care
   e. Emotional care

iii. Role Play – 1 hours

iv. Debriefing session by intensivist - 1 hour

Assessment

1. **Formative:** Pre-test – Post Test; Viva can be used. This could be done immediately after the module and/or later with internal assessment
2. **Summative:** Case based short note on palliative care, MCQ

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Module 4.7
Mental health issues during Pandemics

Description:

The pandemic, besides affecting the physical health, has a potential of immense mental health effects, both during and after its occurrence. The mental health repercussions are on an affected individual and in the general community. There is an apprehension of contracting the disease, the uncertainty of procuring medical help and the unpredictable nature of the disease, which causes fear and anxiety in the people. Social isolation or social distancing impacts wellbeing; work from home and home schooling are new and alien dimensions to life. There are worries about the real-world consequences of the pandemic, such as financial struggles.

The loneliness of quarantine, death and long-term consequences affecting oneself and the family are causes for perturbation in patients. Stigma and guilt for spreading the disease are two burdens carried by most patients. There is an increase in anxiety, depression, stress, post-traumatic stress disorder and the possibility of risk of suicide. Besides these direct and indirect psychosocial effects, the virus directly or through an immune reaction affects the brain and leads to mental health and neurological manifestations. In the aftermath of the disease, long term complications can precipitate mental illness.

Some groups of people are more prone to mental health impact. The vulnerable population are frontline workers, elders, children and adolescent, people suffering from mental illnesses and disabilities, women, migrant workers and individuals in conflict situations.

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Competencies addressed:

The student should be able to:	Level
Describe and discuss the mental health consequences of an epidemic on the general population, patients and health care workers	K
Demonstrate the ability to look after one's mental health during a stressful time of a pandemic	KH
Demonstrate the role of IMG in identification and referral of significant mental illness in response to the pandemic	SH
Demonstrate the ability to counsel patients with minor stress related symptoms in response to the pandemic	SH

Case study

Mr. P. businessman aged 62 years, admitted in a single room of a Covid-19 hospital with mild respiratory symptoms. He could not sleep for two nights. During ward rounds, he expresses worry about the future of his business in case something happens to him. His wife and son were admitted to another isolation hospital, and he was unable to communicate with them and suffers from palpitations and tremors when he thinks about them. You are approached by relatives, who request you to assess him for suicidal ideas.

How will you manage the situation?

Learning points

The student should be able to recognize:

1. The psychological impact of a novel disease and about which there is little known, and many uncertainties exist.

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2. Issues related to quarantine or lockdown such as social distancing, isolation, stigma, loss of contacts.
3. Patient's concerns about availability and cost of treatment, economic issues, probable death and its impact.
4. Signs and symptoms of anxiety, panic and depression and its management.
5. Signs of suicidal ideation and the need for referral of patients if needed.
6. The ability to counsel patients for minor stress related symptoms.

Learning Experience

Year of study: Professional year Phase III Part 2

Hours: 04

v. Interactive Lecture with videos – 1 hour
vi. Group discussion with frontline staff and telephonic conversations with recovered patients and their family members (live or recorded) - 1 hour
vii. Role plays – 1 hour
viii. Debriefing session by a physician, psychiatrist and nurse - 1 hour

Discussion points

Different issues are faced by people belonging to the following categories:

a. Older people who are dependent on others for daily activities and who are technologically handicapped,
b. People with co-morbidities that worsen with any co-existing illness, e.g. Chronic Kidney Disease, Chronic Lung, Liver and heart diseases,
c. Worsening of disorders in persons with pre-existing mental health problems,
d. People with disabilities,
e. Persons who do not stay with their relatives, e.g. at nursing homes, homeless people,
f. Ethnic minorities, persons staying in far off places,
g. Illiterate persons, persons who cannot use electronic media,
h. Healthy persons who are caring for the above types of patients at home.

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There are other relevant issues like:

i. **Knowing when a psychiatry referral is required.** Being aware of where the nearest help is available,
ii. **Knowledge and skills required for supportive counselling.** Counselling involves forming an empathetic, warm and genuine relationship, demonstrating non-judgmental, active listening and giving positive feedback and reassurance. It involves encouraging the person to find simple solutions to their problems,
iii. **Burden and mental health of caretakers.** Health care workers are at risk for mental health issues which can be prevented and treated. Self-care and the need for professional advice as and when required is important. Periodic relaxation with duty breaks may be helpful.

The emotional issues may take the form of anxiety as expressed by persistent and excessive worry, irritability and sleep problems. Panic attacks may present as sudden onset of anxiety with trembling, paresthesia, palpitations, shortness of breath, choking sensation, chest pain, nausea, vomiting, dizziness, sweating and a sense of impending doom.

It is necessary to observe for signs of depression. These include sadness of mood, helplessness, hopelessness, loss of worth, decreased interactions, loss of appetite, loss of sleep, and recurrent thoughts about death or suicide. There may be references to bereaved persons, guilt, self-hatred, and self-harm. Unless taken care of promptly, these may lead to suicidal ideation/ attempts.

Stress may have varying presentations and may include:

- **physical symptoms:** headaches, sleeping and eating difficulties,
- **behavioural symptoms:** low motivation to work, starting or increasing use of alcohol or drugs, decreased interaction,
- **emotional symptoms:** fear, anxiety, sadness and anger.

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A psychiatry referral is required if symptoms are pervasive, distressing and cause impairment. The presence of persistent suicidal ideas is another important reason for a consult. Patients who do not improve with brief counselling interventions would benefit from interventions by a psychiatrist.

Interventions suggested are:

a. Be informed and do not fall prey to rumours and social media infodemic.
b. Have a routine regarding sleep and meals. Allocate time for work, rest and exercise. Set up priorities and follow a daily pattern of activities. Revive hobbies.
c. Be in contact with your social circle. Regular conversations and communications at a personal level with the use of phones or digital media (video conferencing) is important.
d. Restriction of screen time is suggested.
e. Engage oneself in stimulating and motivational activities.
f. Connect with nature, life, people around and with those who have recovered.
g. Look after oneself through nutritious food, exercises, motivating and positive thoughts and practice spirituality.
h. Use relaxation and breathing exercises to help in anxiety and sleep.
i. Seek help from phone counselling and self-help groups.
j. Refer to psychiatrist, if required for telemedicine consults.

Assessment

1. **Formative:** DOPS, Viva can be used. This could be done immediately after the module and/or later with internal assessment.

2. **Summative:** not required.

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Further reading:

WHO. Mental health and psychosocial considerations during the COVID-19 outbreak- Interim guidance WHO/2019-nCoV/MentalHealth/2020.1 available at https://www.who.int/publications/i/item/WHO-2019-nCoV-MentalHealth-2020.1

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The copy of THE EPIDEMIC DISEASES ACT, 1897 & THE DISASTER MANAGEMENT ACT, 2005 which have been attached as Annexure I and Annexure II respectively, have been obtained from India Code Depository of All Central and States Acts Website.

Link:- https://www.indiacode.nic.in/

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Annexure I

THE EPIDEMIC DISEASES ACT, 1897

&

Annexure II

THE DISASTER MANAGEMENT ACT, 2005

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THE EPIDEMIC DISEASES ACT, 1897

ARRANGEMENT OF SECTIONS

SECTIONS

1. Short title and extent.
2. Power to take special measures and prescribe regulations as to dangerous epidemic disease.

2A. Powers of Central Government.

3. Penalty.
4. Protection to persons acting under Act.

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THE EPIDEMIC DISEASES ACT, 1897

ACT NO. 3 OF 1897[1]

[4*th February*, 1897.]

An Act to provide for the better prevention of the spread of Dangerous Epidemic Diseases.

WHEREAS it is expedient to provide for the better prevention of the spread of dangerous epidemic disease; It is hereby enacted as follows :—

1. Short title and extent.—(*1*) This Act may be called the Epidemic Diseases Act, 1897.

[2][(*2*) It extends to the whole of India except [3][the territories which, immediately before the 1st November, 1956, were comprised in Part B States]] [4]* * *

[5]* * * * *

[6]**2. Power to take special measures and prescribe regulations as to dangerous epidemic disease.**—(*1*) When at any time the [7][State Government] is satisfied that [7][the State] or any part thereof is visited by, or threatened with, an outbreak of any dangerous epidemic disease, the [8][State Government], if [9][it] thinks that the ordinary provisions of the law for the time being in force are insufficient for the purpose, may take, or require or empower any person to take, such measures and, by public notice, prescribe such temporary regulations to be observed by the public or by any person or class of persons as [9][it] shall deem necessary to prevent the outbreak of such disease or the spread thereof, and may determine in what manner and by whom any expenses incurred (including compensation if any) shall be defrayed.

(*2*) In particular and without prejudice to the generality of the foregoing provisions, the [7][State Government] may take measures and prescribe regulations for—

[10]* * * * *

(*b*) the inspection of persons travelling by railway or otherwise, and the segregation, in hospital, temporary accommodation or otherwise, of persons suspected by the inspecting officer of being infected with any such disease.

[11]* * * * *

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1. This Act has been amended in its application to—
   (*1*) the Punjab by the Epidemic Diseases (Punjab Amendment) Act, 1944 (Punjab Act 3 of 1944); in East Punjab by East Punjab Act 1 of 1947:
   (*2*) the C. P. and Berar by the C. P. and Berar Epidemic Diseases (Amendment) Act, 1945 (C. P. and Berar Act 4 of 1945).
   The Act has been extended to—
   (*1*) the whole of Madhya Pradesh by M.P. Act 23 of 1958 (when notified).
   (*2*) the transferred territories of Punjab by Punjab Act 8 of 1961.
   (*3*) in Dadra and Nagar Haveli (w.e.f. 1-7-1965) by Reg. 6 of 1963, s. 2 and Sch.
   (*4*) to Lakshadweep (w.e.f. 1-10-1967) : *vide* Reg. 8 of 1965, s. 3 and Sch.
   (*5*) Union territory of Pondicherry by Act 26 of 1968, s. 3 and Sch.
   The Act has been repealed in its application to Bellary District by Mysore Act 14 of 1955.
2. Subs. by the A.O. 1950.
3. Subs. by the Adaptation of Laws (No. 2) Order, 1956 for "Part B States".
4. The word "and" rep. by Act 10 of 1914, s. 3 and the Second Schedule.
5. Sub-section (*3*) rep. by s. 3 and the Second Schedule, *ibid*.
6. For Notifications issued under this section, *see* different local Rules and Orders.
7. Subs. by the A.O. 1937, for "G.G. in C."
8. Subs., *ibid.*, for "India".
9. Subs., *ibid.*, for "he".
10. Paragraph (*a*) omitted, *ibid.*
11. Sub-section (*3*) omitted by Act 38 of 1920, s. 2 and the First Schedule.

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[1][**2A. Powers of Central Government.**—When the Central Government is satisfied that India or any part thereof is visited by, or threatened with, an outbreak of any dangerous epidemic disease and that the ordinary provisions of the law for the time being in force are insufficient to prevent the outbreak of such disease or the spread thereof, the Central Government may take measures and prescribe regulations for the inspection of any ship or vessel leaving or arriving at any port in [2][the territories to which this Act extends] and for such detention thereof, or of any person intending to sail therein, or arriving thereby, as may be necessary.]

3. Penalty.—Any person disobeying any regulation or order made under this Act shall be deemed to have committed an offence punishable under section 188 of the Indian Penal Code (45 of 1860).

4. Protection to persons acting under Act.—No suit or other legal proceeding shall lie against any person for anything done or in good faith intended to be done under this Act.

———

1. Ins. by Act 38 of 1920, s. 2 and the First Schedule. Earlier substituted by the A.O.1937.
2. Subs. by the Adaptation of Laws (No.2) Order, 1956, for "a Part A State or a Part C State".

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THE DISASTER MANAGEMENT ACT, 2005

ARRAGEMENT OF SECTIONS

CHAPTER I

PRELIMINARY

SECTIONS

1. Short title, extent and commencement.
2. Definitions.

CHAPTER II

THE NATIONAL DISASTER MANAGEMENT AUTHORITY

3. Establishment of National Disaster Management Authority.
4. Meetings of National Authority.
5. Appointment of officers and other employees of the National Authority.
6. Powers and functions of National Authority.
7. Constitution of advisory committee by National Authority.
8. Constitution of National Executive Committee.
9. Constitution of sub-committees.
10. Powers and functions of National Executive Committee.
11. National plan.
12. Guidelines for minimum standards of relief.
13. Relief in loan repayment, etc.

CHAPTER III

STATE DISASTER MANAGEMENT AUTHORITY

14. Establishment of State Disaster Management Authority.
15. Meetings of the State Authority.
16. Appointment of officers and other employees of State Authority.
17. Constitution of advisory committee by the State Authority.
18. Powers and functions of State Authority.
19. Guidelines for minimum standard of relief by State Authority.
20. Constitution of State Executive Committee.
21. Constitution of sub-committees by State Executive Committee.
22. Functions of the State Executive Committee.
23. State Plan.
24. Powers and functions of State Executive Committee in the event of threatening disaster situation.

CHAPTER IV

DISTRICT DISASTER MANAGEMENT AUTHORITY

25. Constitution of District Disaster Management Authority.
26. Powers of Chairperson of District Authority.

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SECTIONS

27. Meetings.
28. Constitution of advisory committees and other committees.
29. Appointment of officers and other employees of District Authority.
30. Powers and functions of District Authority.
31. District Plan.
32. Plans by different authorities at district level and their implementation.
33. Requisition by the District Authority.
34. Powers and functions of District Authority in the event of any threatening disaster situation or disaster.

CHAPTER V

MEASURES BY THE GOVERNMENT FOR DISASTER MANAGEMENT

35. Central Government to take measures.
36. Responsibilities of Ministries or Departments of Government of India.
37. Disaster management plans of Ministries or Departments of Government of India.
38. State Government to take measures.
39. Responsibilities of departments of the State Government.
40. Disaster management plan of departments of State.

CHAPTER VI

LOCAL AUTHORITIES

41. Functions of the local authority.

CHAPTER VII

NATIONAL INSTITUTEOF DISASTER MANAGEMENT

42. National Institute of Disaster Management.
43. Officers and other employees of the National Institute.

CHAPTER VIII

NATIONAL DISASTER RESPONSE FORCE

44. National Disaster Response Force.
45. Control, direction, etc.

CHAPTER IX

FINANCE, ACCOUNTS AND AUDIT

46. National Disaster Response Fund.
47. National Disaster Mitigation Fund.
48. Establishment of funds by State Government.
49. Allocation of funds by Ministries and Departments.
50. Emergency procurement and accounting.

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THE DISASTER MANAGEMENT ACT, 2005

ACT NO. 53 OF 2005

[23*rd December*, 2005.]

An Act to provide for the effective management of disasters and for matters connected therewith or incidental thereto.

BE it enacted by Parliament in the Fifty-sixth Year of the Republic of India as follows:—

CHAPTER I

PRELIMINARY

1. Short title, extent and commencement.—(*1*) This Act may be called the Disaster Management Act, 2005.

(*2*) It extends to the whole of India.

(*3*) It shall come into force on such date[1] as the Central Government may, by notification in the Official Gazette appoint; and different dates* may be appointed for different provisions of this Act and for different States, and any reference to commencement in any provision of this Act in relation to any State shall be construed as a reference to the commencement of that provision in that State.

2. Definitions.—In this Act, unless the context otherwise requires,—

(*a*) "affected area" means an area or part of the country affected by a disaster;

(*b*) "capacity-building" includes—

(*i*) identification of existing resources and resources to be acquired or created;

(*ii*) acquiring or creating resources identified under sub-clause (*i*);

(*iii*) organisation and training of personnel and coordination of such training for effective management of disasters;

(*c*) "Central Government" means the Ministry or Department of the Government of India having administrative control of disaster management;

(*d*) "disaster" means a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man made causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area;

(*e*) "disaster management" means a continuous and integrated process of planning, organising, coordinating and implementing measures which are necessary or expedient for—

(*i*) prevention of danger or threat of any disaster;

(*ii*) mitigation or reduction of risk of any disaster or its severity or consequences;

(*iii*) capacity-building;

(*iv*) preparedness to deal with any disaster;

(*v*) prompt response to any threatening disaster situation or disaster;

(*vi*) assessing the severity or magnitude of effects of any disaster;

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1. 28th July, 2006 (ss. 2, 3, 4, 5, 6, 8, 10, 75, 77, 79), *vide* notification No. S.O. 1216(E), dated 28th July, 2006;

*1st August, 2007 [ss. 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 38, 39, 40, 41, 48, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, sub-sec. (2) of s. 70, 71, 72, 73, 74, 78, 79], *vide* notification No. S.O. 722(E), dated 7th May, 2007;

*17th March, 2008 (ss. 44, 45), *vide* notification No. 517(E), dated 17th March, 2008;

*18th October, 2011 (s. 46), *vide* notification No. S.O. 2397(E), dated 18th October, 2011, Extraordinary, Part II, sec. 3(*ii*).

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(*vii*) evacuation, rescue and relief;

(*viii*) rehabilitation and reconstruction;

(*f*) "District Authority" means the District Disaster Management Authority constituted under sub-section (*1*) of section 25;

(*g*) "District Plan" means the plan for disaster management for the district prepared under section 31;

(*h*) "local authority" includes panchayati raj institutions, municipalities, a district board, cantonment board, town planning authority or Zila Parishad or any other body or authority, by whatever name called, for the time being invested by law, for rendering essential services or, with the control and management of civic services, within a specified local area;

(*i*) "mitigation" means measures aimed at reducing the risk, impact or effects of a disaster or threatening disaster situation;

(*j*) "National Authority" means the National Disaster Management Authority established under sub-section (*1*) of section 3;

(*k*) "National Executive Committee" means the Executive Committee of the National Authority constituted under sub-section (*1*) of section 8;

(*l*) "National Plan" means the plan for disaster management for the whole of the country prepared under section 11;

(*m*) "preparedness" means the state of readiness to deal with a threatening disaster situation or disaster and the effects thereof;

(*n*) "prescribed" means prescribed by rules made under this Act;

(*o*) "reconstruction" means construction or restoration of any property after a disaster;

(*p*) "resources" includes manpower, services, materials and provisions;

(*q*) "State Authority" means the State Disaster Management Authority established under sub-section (*1*) of section 14 and includes the Disaster Management Authority for the Union territory constituted under that section;

(*r*) "State Executive Committee" means the Executive Committee of a State Authority constituted under sub-section (*1*) of section 20;

(*s*) "State Government" means the Department of Government of the State having administrative control of disaster management and includes Administrator of the Union territory appointed by the President under article 239 of the Constitution;

(*t*) "State Plan" means the plan for disaster management for the whole of the State prepared under section 23.

CHAPTER II

THE NATIONAL DISASTER MANAGEMENT AUTHORITY

3. Establishment of National Disaster Management Authority.—(*1*) With effect from such date as the Central Government may, by notification in the Official Gazette appoint in this behalf, there shall be established for the purposes of this Act, an authority to be known as the National Disaster Management Authority.

(*2*) The National Authority shall consist of the Chairperson and such number of other members, not exceeding nine, as may be prescribed by the Central Government and, unless the rules otherwise provide, the National Authority shall consist of the following:—

(*a*) the Prime Minister of India, who shall be the Chairperson of the National Authority, *ex officio;*

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(*b*) other members, not exceeding nine, to be nominated by the Chairperson of the National Authority.

(*3*) The Chairperson of the National Authority may designate one of the members nominated under clause (*b*) of sub-section (*2*) to be the Vice-Chairperson of the National Authority.

(*4*) The term of office and conditions of service of members of the National Authority shall be such as may be prescribed.

4. Meetings of National Authority.—(*1*) The National Authority shall meet as and when necessary and at such time and place as the Chairperson of the National Authority may think fit.

(*2*) The Chairperson of the National Authority shall preside over the meetings of the National Authority.

(*3*) If for any reason the Chairperson of the National Authority is unable to attend any meeting of the National Authority, the Vice-Chairperson of the National Authority shall preside over the meeting.

5. Appointment of officers and other employees of the National Authority.—The Central Government shall provide the National Authority with such officers, consultants and employees, as it considers necessary for carrying out the functions of the National Authority.

6. Powers and functions of National Authority.—(*1*) Subject to the provisions of this Act, the National Authority shall have the responsibility for laying down the policies, plans and guidelines for disaster management for ensuring timely and effective response to disaster.

(*2*) Without prejudice to generality of the provisions contained in sub-section (*1*), the National Authority may —

(*a*) lay down policies on disaster management;

(*b*) approve the National Plan;

(*c*) approve plans prepared by the Ministries or Departments of the Government of India in accordance with the National Plan;

(*d*) lay down guidelines to be followed by the State Authorities in drawing up the State Plan;

(*e*) lay down guidelines to be followed by the different Ministries or Departments of the Government of India for the purpose of integrating the measures for prevention of disaster or the mitigation of its effects in their development plans and projects;

(*f*) coordinate the enforcement and implementation of the policy and plan for disaster management;

(*g*) recommend provision of funds for the purpose of mitigation;

(*h*) provide such support to other countries affected by major disasters as may be determined by the Central Government;

(*i*) take such other measures for the prevention of disaster, or the mitigation, or preparedness and capacity building for dealing with the threatening disaster situation or disaster as it may consider necessary;

(*j*) lay down broad policies and guidelines for the functioning of the National Institute of Disaster Management.

(*3*) The Chairperson of the National Authority shall, in the case of emergency, have power to exercise all or any of the powers of the National Authority but exercise of such powers shall be subject to *ex post facto* ratification by the National Authority.

7. Constitution of advisory committee by National Authority.—(*1*) The National Authority may constitute an advisory committee consisting of experts in the field of disaster management and having practical experience of disaster management at the national, State or district level to make recommendations on different aspects of disaster management.

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(*2*) The members of the advisory committee shall be paid such allowances as may be prescribed by the Central Government in consultation with the National Authority.

8. Constitution of National Executive Committee.—(*1*) The Central Government shall, immediately after issue of notification under sub-section (*1*) of section 3, constitute a National Executive Committee to assist the National Authority in the performance of its functions under this Act.

(*2*) The National Executive Committee shall consist of the following members, namely:—

(*a*) the Secretary to the Government of India in charge of the Ministry or Department of the Central Government having administrative control of the disaster management, who shall be Chairperson, *ex officio;*

(*b*) the Secretaries to the Government of India in the Ministries or Departments having administrative control of the agriculture, atomic energy, defence, drinking water supply, environment and forests, finance (expenditure), health, power, rural development, science and technology, space, telecommunication, urban development, water resources and the Chief of the Integrated Defence Staff of the Chiefs of Staff Committee, *ex officio*.

(*3*) The Chairperson of the National Executive Committee may invite any other officer of the Central Government or a State Government for taking part in any meeting of the National Executive Committee and shall exercise such powers and perform such functions as may be prescribed by the Central Government in consultation with the National Authority.

(*4*) The procedure to be followed by the National Executive Committee in exercise of its powers and discharge of its functions shall be such as may be prescribed by the Central Government.

9. Constitution of sub-committees.—(*1*) The National Executive Committee may, as and when it considers necessary, constitute one or more sub-committees, for the efficient discharge of its functions.

(*2*) The National Executive Committee shall, from amongst its members, appoint the Chairperson of the sub-committee referred to in sub-section (*1*).

(*3*) Any person associated as an expert with any sub-committee may be paid such allowances as may be prescribed by the Central Government.

10. Powers and functions of National Executive Committee.—(*1*) The National Executive Committee shall assist the National Authority in the discharge of its functions and have the responsibility for implementing the policies and plans of the National Authority and ensure the compliance of directions issued by the Central Government for the purpose of disaster management in the country.

(*2*) Without prejudice to the generality of the provisions contained in sub-section (*1*), the National Executive Committee may—

(*a*) act as the coordinating and monitoring body for disaster management;

(*b*) prepare the National Plan to be approved by the National Authority;

(*c*) coordinate and monitor the implementation of the National Policy;

(*d*) lay down guidelines for preparing disaster management plans by different Ministries or Departments of the Government of India and the State Authorities;

(*e*) provide necessary technical assistance to the State Governments and the State Authorities for preparing their disaster management plans in accordance with the guidelines laid down by the National Authority;

(*f*) monitor the implementation of the National Plan and the plans prepared by the Ministries or Departments of the Government of India;

(*g*) monitor the implementation of the guidelines laid down by the National Authority for integrating of measures for prevention of disasters and mitigation by the Ministries or Departments in their development plans and projects;

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(*h*) monitor, coordinate and give directions regarding the mitigation and preparedness measures to be taken by different Ministries or Departments and agencies of the Government;

(*i*) evaluate the preparedness at all governmental levels for the purpose of responding to any threatening disaster situation or disaster and give directions, where necessary, for enhancing such preparedness;

(*j*) plan and coordinate specialised training programme for disaster management for different levels of officers, employees and voluntary rescue workers;

(*k*) coordinate response in the event of any threatening disaster situation or disaster;

(*l*) lay down guidelines for, or give directions to, the concerned Ministries or Departments of the Government of India, the State Governments and the State Authorities regarding measures to be taken by them in response to any threatening disaster situation or disaster;

(*m*) require any department or agency of the Government to make available to the National Authority or State Authorities such men or material resources as are available with it for the purposes of emergency response, rescue and relief;

(*n*) advise, assist and coordinate the activities of the Ministries or Departments of the Government of India, State Authorities, statutory bodies, other governmental or non-governmental organisations and others engaged in disaster management;

(*o*) provide necessary technical assistance or give advice to the State Authorities and District Authorities for carrying out their functions under this Act;

(*p*) promote general education and awareness in relation to disaster management; and

(*q*) perform such other functions as the National Authority may require it to perform.

11. National Plan.—(*1*) There shall be drawn up a plan for disaster management for the whole of the country to be called the National Plan.

(*2*) The National Plan shall be prepared by the National Executive Committee having regard to the National Policy and in consultation with the State Governments and expert bodies or organisations in the field of disaster management to be approved by the National Authority.

(*3*) The National Plan shall include—

(*a*) measures to be taken for the prevention of disasters, or the mitigation of their effects;

(*b*) measures to be taken for the integration of mitigation measures in the development plans;

(*c*) measures to be taken for preparedness and capacity building to effectively respond to any threatening disaster situations or disaster;

(*d*) roles and responsibilities of different Ministries or Departments of the Government of India in respect of measures specified in clauses (*a*), (*b*) and (*c*).

(*4*) The National Plan shall be reviewed and updated annually.

(*5*) Appropriate provisions shall be made by the Central Government for financing the measures to be carried out under the National Plan.

(*6*) Copies of the National Plan referred to in sub-sections (*2*) and (*4*) shall be made available to the Ministries or Departments of the Government of India and such Ministries or Departments shall draw up their own plans in accordance with the National Plan.

12. Guidelines for minimum standards of relief.—The National Authority shall recommend guidelines for the minimum standards of relief to be provided to persons affected by disaster, which shall include,—

(*i*) the minimum requirements to be provided in the relief camps in relation to shelter, food, drinking water, medical cover and sanitation;

(*ii*) the special provisions to be made for widows and orphans;

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(*iii*) *ex gratia* assistance on account of loss of life as also assistance on account of damage to houses and for restoration of means of livelihood;

(*iv*) such other relief as may be necessary.

13. Relief in loan repayment, etc.—The National Authority may, in cases of disasters of severe magnitude, recommend relief in repayment of loans or for grant of fresh loans to the persons affected by disaster on such concessional terms as may be appropriate.

CHAPTER III

STATE DISASTER MANAGEMENT AUTHORITIES

14. Establishment of State Disaster Management Authority.—(*1*) Every State Government shall, as soon as may be after the issue of the notification under sub-section (*1*) of section 3, by notification in the Official Gazette, establish a State Disaster Management Authority for the State with such name as may be specified in the notification of the State Government.

(*2*) A State Authority shall consist of the Chairperson and such number of other members, not exceeding nine, as may be prescribed by the State Government and, unless the rules otherwise provide, the State Authority shall consist of the following members, namely:—

(*a*) the Chief Minister of the State, who shall be Chairperson, *ex officio*;

(*b*) other members, not exceeding eight, to be nominated by the Chairperson of the State Authority;

(*c*) the Chairperson of the State Executive Committee, *ex officio*.

(*3*) The Chairperson of the State Authority may designate one of the members nominated under clause (*b*) of sub-section (*2*) to be the Vice-Chairperson of the State Authority.

(*4*) The Chairperson of the State Executive Committee shall be the Chief Executive Officer of the State Authority, *ex officio*:

Provided that in the case of a Union territory having Legislative Assembly, except the Union territory of Delhi, the Chief Minister shall be the Chairperson of the Authority established under this section and in case of other Union territories, the Lieutenant Governor or the Administrator shall be the Chairperson of that Authority:

Provided further that the Lieutenant Governor of the Union territory of Delhi shall be the Chairperson and the Chief Minister thereof shall be the Vice-Chairperson of the State Authority.

(*5*) The term of office and conditions of service of members of the State Authority shall be such as may be prescribed.

15. Meetings of the State Authority.—(*1*) The State Authority shall meet as and when necessary and at such time and place as the Chairperson of the State Authority may think fit.

(*2*) The Chairperson of the State Authority shall preside over the meetings of the State Authority.

(*3*) If for any reason, the Chairperson of the State Authority is unable to attend the meeting of the State Authority, the Vice-Chairperson of the State Authority shall preside at the meeting.

16. Appointment of officers and other employees of State Authority.—The State Government shall provide the State Authority with such officers, consultants and employees, as it considers necessary, for carrying out the functions of the State Authority.

17. Constitution of advisory committee by the State Authority.—(*1*) A State Authority may, as and when it considers necessary, constitute an advisory committee, consisting of experts in the field of disaster management and having practical experience of disaster management to make recommendations on different aspects of disaster management.

(*2*) The members of the advisory committee shall be paid such allowances as may be prescribed by the State Government.

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18. Powers and functions of State Authority.—(*1*) Subject to the provisions of this Act, a State Authority shall have the responsibility for laying down policies and plans for disaster management in the State.

(*2*) Without prejudice to the generality of provisions contained in sub-section (*1*), the State Authority may—

(*a*) lay down the State disaster management policy;

(*b*) approve the State Plan in accordance with the guidelines laid down by the National Authority;

(*c*) approve the disaster management plans prepared by the departments of the Government of the State;

(*d*) lay down guidelines to be followed by the departments of the Government of the State for the purposes of integration of measures for prevention of disasters and mitigation in their development plans and projects and provide necessary technical assistance therefor;

(*e*) coordinate the implementation of the State Plan;

(*f*) recommend provision of funds for mitigation and preparedness measures;

(*g*) review the development plans of the different departments of the State and ensure that prevention and mitigation measures are integrated therein;

(*h*) review the measures being taken for mitigation, capacity building and preparedness by the departments of the Government of the State and issue such guidelines as may be necessary.

(*3*) The Chairperson of the State Authority shall, in the case of emergency, have power to exercise all or any of the powers of the State Authority but the exercise of such powers shall be subject to *ex post facto* ratification of the State Authority.

19. Guidelines for minimum standard of relief by State Authority.—The State Authority shall lay down detailed guidelines for providing standards of relief to persons affected by disaster in the State:

Provided that such standards shall in no case be less than the minimum standards in the guidelines laid down by the National Authority in this regard.

20. Constitution of State Executive Committee.—(*1*) The State Government shall, immediately after issue of notification under sub-section (*1*) of section 14, constitute a State Executive Committee to assist the State Authority in the performance of its functions and to coordinate action in accordance with the guidelines laid down by the State Authority and ensure the compliance of directions issued by the State Government under this Act.

(*2*) The State Executive Committee shall consist of the following members, namely:—

(*a*) the Chief Secretary to the State Government, who shall be Chairperson, *ex officio*;

(*b*) four Secretaries to the Government of the State of such departments as the State Government may think fit, *ex officio*.

(*3*) The Chairperson of the State Executive Committee shall exercise such powers and perform such functions as may be prescribed by the State Government and such other powers and functions as may be delegated to him by the State Authority.

(*4*) The procedure to be followed by the State Executive Committee in exercise of its powers and discharge of its functions shall be such as may be prescribed by the State Government.

21. Constitution of sub-committees by State Executive Committee.—(*1*) The State Executive Committee may, as and when it considers necessary, constitute one or more sub-committees, for efficient discharge of its functions.

(*2*) The State Executive Committee shall, from amongst its members, appoint the Chairperson of the sub-committee referred to in sub-section (*1*).

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(*3*) Any person associated as an expert with any sub-committee may be paid such allowances as may be prescribed by the State Government.

22. Functions of the State Executive Committee.—(*1*) The State Executive Committee shall have the responsibility for implementing the National Plan and State Plan and act as the coordinating and monitoring body for management of disaster in the State.

(*2*) Without prejudice to the generality of the provisions of sub-section (*1*), the State Executive Committee may—

(*a*) coordinate and monitor the implementation of the National Policy, the National Plan and the State Plan;

(*b*) examine the vulnerability of different parts of the State to different forms of disasters and specify measures to be taken for their prevention or mitigation;

(*c*) lay down guidelines for preparation of disaster management plans by the departments of the Government of the State and the District Authorities;

(*d*) monitor the implementation of disaster management plans prepared by the departments of the Government of the State and District Authorities;

(*e*) monitor the implementation of the guidelines laid down by the State Authority for integrating of measures for prevention of disasters and mitigation by the departments in their development plans and projects;

(*f*) evaluate preparedness at all governmental or non-governmental levels to respond to any threatening disaster situation or disaster and give directions, where necessary, for enhancing such preparedness;

(*g*) coordinate response in the event of any threatening disaster situation or disaster;

(*h*) give directions to any Department of the Government of the State or any other authority or body in the State regarding actions to be taken in response to any threatening disaster situation or disaster;

(*i*) promote general education, awareness and community training in regard to the forms of disasters to which different parts of the State are vulnerable and the measures that may be taken by such community to prevent the disaster, mitigate and respond to such disaster;

(*j*) advise, assist and coordinate the activities of the Departments of the Government of the State, District Authorities, statutory bodies and other governmental and non-governmental organisations engaged in disaster management;

(*k*) provide necessary technical assistance or give advice to District Authorities and local authorities for carrying out their functions effectively;

(*l*) advise the State Government regarding all financial matters in relation to disaster management;

(*m*) examine the construction, in any local area in the State and, if it is of the opinion that the standards laid for such construction for the prevention of disaster is not being or has not been followed, may direct the District Authority or the local authority, as the case may be, to take such action as may be necessary to secure compliance of such standards;

(*n*) provide information to the National Authority relating to different aspects of disaster management;

(*o*) lay down, review and update State level response plans and guidelines and ensure that the district level plans are prepared, reviewed and updated;

(*p*) ensure that communication systems are in order and the disaster management drills are carried out periodically;

(*q*) perform such other functions as may be assigned to it by the State Authority as it may consider necessary.

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23. State Plan.—(*1*) There shall be a plan for disaster management for every State to be called the State Disaster Management Plan.

(*2*) The State Plan shall be prepared by the State Executive Committee having regard to the guidelines laid down by the National Authority and after such consultation with local authorities, district authorities and the people's representatives as the State Executive Committee may deem fit.

(*3*) The State Plan prepared by the State Executive Committee under sub-section (*2*) shall be approved by the State Authority.

(*4*) The State Plan shall include,—

(*a*) the vulnerability of different parts of the State to different forms of disasters;

(*b*) the measures to be adopted for prevention and mitigation of disasters;

(*c*) the manner in which the mitigation measures shall be integrated with the development plans and projects;

(*d*) the capacity-building and preparedness measures to be taken;

(*e*) the roles and responsibilities of each Department of the Government of the State in relation to the measures specified in clauses (*b*), (*c*) and (*d*) above;

(*f*) the roles and responsibilities of different Departments of the Government of the State in responding to any threatening disaster situation or disaster.

(*5*) The State Plan shall be reviewed and updated annually.

(*6*) Appropriate provisions shall be made by the State Government for financing for the measures to be carried out under the State Plan.

(*7*) Copies of the State Plan referred to in sub-sections (*2*) and (*5*) shall be made available to the Departments of the Government of the State and such Departments shall draw up their own plans in accordance with the State Plan.

24. Powers and functions of State Executive Committee in the event of threatening disaster situation.—For the purpose of, assisting and protecting the community affected by disaster or providing relief to such community or, preventing or combating disruption or dealing with the effects of any threatening disaster situation, the State Executive Committee may—

(*a*) control and restrict, vehicular traffic to, from or within, the vulnerable or affected area;

(*b*) control and restrict the entry of any person into, his movement within and departure from, a vulnerable or affected area;

(*c*) remove debris, conduct search and carry out rescue operations;

(*d*) provide shelter, food, drinking water, essential provisions, healthcare and services in accordance with the standards laid down by the National Authority and State Authority;

(*e*) give direction to the concerned Department of the Government of the State, any District Authority or other authority, within the local limits of the State to take such measure or steps for rescue, evacuation or providing immediate relief saving lives or property, as may be necessary in its opinion;

(*f*) require any department of the Government of the State or any other body or authority or person in charge of any relevant resources to make available the resources for the purposes of emergency response, rescue and relief;

(*g*) require experts and consultants in the field of disasters to provide advice and assistance for rescue and relief;

(*h*) procure exclusive or preferential use of amenities from any authority or person as and when required;

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(*i*) construct temporary bridges or other necessary structures and demolish unsafe structures which may be hazardous to public;

(*j*) ensure that non-governmental organisations carry out their activities in an equitable and non-discriminatory manner;

(*k*) disseminate information to public to deal with any threatening disaster situation or disaster;

(*l*) take such steps as the Central Government or the State Government may direct in this regard or take such other steps as are required or warranted by the form of any threatening disaster situation or disaster.

CHAPTER IV

DISTRICT DISASTER MANAGEMENT AUTHORITY

25. Constitution of District Disaster Management Authority.—(*1*) Every State Government shall, as soon as may be after issue of notification under sub-section (*1*) of section 14, by notification in the Official Gazette, establish a District Disaster Management Authority for every district in the State with such name as may be specified in that notification.

(*2*) The District Authority shall consist of the Chairperson and such number of other members, not exceeding seven, as may be prescribed by the State Government, and unless the rules otherwise provide, it shall consist of the following, namely:—

(*a*) the Collector or District Magistrate or Deputy Commissioner, as the case may be, of the district who shall be Chairperson, *ex officio*;

(*b*) the elected representative of the local authority who shall be the co-Chairperson, *ex officio*:

Provided that in the Tribal Areas, as referred to in the Sixth Schedule to the Constitution, the Chief Executive Member of the district council of autonomous district, shall be the co-Chairperson, *ex officio*;

(*c*) the Chief Executive Officer of the District Authority, *ex officio*;

(*d*) the Superintendent of Police, *ex officio*;

(*e*) the Chief Medical Officer of the district, *ex officio*;

(*f*) not exceeding two other district level officers, to be appointed by the State Government.

(*3*) In any district where zila parishad exists, the Chairperson thereof shall be the co-Chairperson of the District Authority.

(*4*) The State Government shall appoint an officer not below the rank of Additional Collector or Additional District Magistrate or Additional Deputy Commissioner, as the case may be, of the district to be the Chief Executive Officer of the District Authority to exercise such powers and perform such functions as may be prescribed by the State Government and such other powers and functions as may be delegated to him by the District Authority.

26. Powers of Chairperson of District Authority.—(*1*) The Chairperson of the District Authority shall, in addition to presiding over the meetings of the District Authority, exercise and discharge such powers and functions of the District Authority as the District Authority may delegate to him.

(*2*) The Chairperson of the District Authority shall, in the case of an emergency, have power to exercise all or any of the powers of the District Authority but the exercise of such powers shall be subject to *ex post facto* ratification of the District Authority.

(*3*) The District Authority or the Chairperson of the District Authority may, by general or special order, in writing, delegate such of its or his powers and functions, under sub-section (*1*) or (*2*), as the case may be, to the Chief Executive Officer of the District Authority, subject to such conditions and limitations, if any, as it or he deems fit.

27. Meetings.—The District Authority shall meet as and when necessary and at such time and place as the Chairperson may think fit.

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28. Constitution of advisory committees and other committees.—(*1*) The District Authority may, as and when it considers necessary, constitute one or more advisory committees and other committees for the efficient discharge of its functions.

(*2*) The District Authority shall, from amongst its members, appoint the Chairperson of the Committee referred to in sub-section (*1*).

(*3*) Any person associated as an expert with any committee or sub-committee constituted under sub-section (*1*) may be paid such allowances as may be prescribed by the State Government.

29. Appointment of officers and other employees of District Authority.—The State Government shall provide the District Authority with such officers, consultants and other employees as it considers necessary for carrying out the functions of District Authority.

30. Powers and functions of District Authority.—(*1*) The District Authority shall act as the district planning, coordinating and implementing body for disaster management and take all measures for the purposes of disaster management in the district in accordance with the guidelines laid down by the National Authority and the State Authority.

(*2*) Without prejudice to the generality of the provisions of sub-section (*1*), the District Authority may—

(*i*) prepare a disaster management plan including district response plan for the district;

(*ii*) coordinate and monitor the implementation of the National Policy, State Policy, National Plan, State Plan and District Plan;

(*iii*) ensure that the areas in the district vulnerable to disasters are identified and measures for the prevention of disasters and the mitigation of its effects are undertaken by the departments of the Government at the district level as well as by the local authorities;

(*iv*) ensure that the guidelines for prevention of disasters, mitigation of its effects, preparedness and response measures as laid down by the National Authority and the State Authority are followed by all departments of the Government at the district level and the local authorities in the district;

(*v*) give directions to different authorities at the district level and local authorities to take such other measures for the prevention or mitigation of disasters as may be necessary;

(*vi*) lay down guidelines for prevention of disaster management plans by the department of the Government at the districts level and local authorities in the district;

(*vii*) monitor the implementation of disaster management plans prepared by the Departments of the Government at the district level;

(*viii*) lay down guidelines to be followed by the Departments of the Government at the district level for purposes of integration of measures for prevention of disasters and mitigation in their development plans and projects and provide necessary technical assistance therefor;

(*ix*) monitor the implementation of measures referred to in clause (*viii*);

(*x*) review the state of capabilities for responding to any disaster or threatening disaster situation in the district and give directions to the relevant departments or authorities at the district level for their up gradation as may be necessary;

(*xi*) review the preparedness measures and give directions to the concerned departments at the district level or other concerned authorities where necessary for bringing the preparedness measures to the levels required for responding effectively to any disaster or threatening disaster situation;

(*xii*) organise and coordinate specialised training programmes for different levels of officers, employees and voluntary rescue workers in the district;

(*xiii*) facilitate community training and awareness programmes for prevention of disaster or mitigation with the support of local authorities, governmental and non-governmental organisations;

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(*xiv*) set up, maintain, review and upgrade the mechanism for early warnings and dissemination of proper information to public;

(*xv*) prepare, review and update district level response plan and guidelines;

(*xvi*) coordinate response to any threatening disaster situation or disaster;

(*xvii*) ensure that the Departments of the Government at the district level and the local authorities prepare their response plans in accordance with the district response plan;

(*xviii*) lay down guidelines for, or give direction to, the concerned Department of the Government at the district level or any other authorities within the local limits of the district to take measures to respond effectively to any threatening disaster situation or disaster;

(*xix*) advise, assist and coordinate the activities of the Departments of the Government at the district level, statutory bodies and other governmental and non-governmental organisations in the district engaged in the disaster management;

(*xx*) coordinate with, and give guidelines to, local authorities in the district to ensure that measures for the prevention or mitigation of threatening disaster situation or disaster in the district are carried out promptly and effectively;

(*xxi*) provide necessary technical assistance or give advise to the local authorities in the district for carrying out their functions;

(*xxii*) review development plans prepared by the Departments of the Government at the district level, statutory authorities or local authorities with a view to make necessary provisions therein for prevention of disaster or mitigation;

(*xxiii*) examine the construction in any area in the district and, if it is of the opinion that the standards for the prevention of disaster or mitigation laid down for such construction is not being or has not been followed, may direct the concerned authority to take such action as may be necessary to secure compliance of such standards;

(*xxiv*) identify buildings and places which could, in the event of any threatening disaster situation or disaster, be used as relief centers or camps and make arrangements for water supply and sanitation in such buildings or places;

(*xxv*) establish stockpiles of relief and rescue materials or ensure preparedness to make such materials available at a short notice;

(*xxvi*) provide information to the State Authority relating to different aspects of disaster management;

(*xxvii*) encourage the involvement of non-governmental organisations and voluntary social-welfare institutions working at the grassroots level in the district for disaster management;

(*xxviii*) ensure communication systems are in order, and disaster management drills are carried out periodically;

(*xxix*) perform such other functions as the State Government or State Authority may assign to it or as it deems necessary for disaster management in the District.

31. District Plan.—(*1*) There shall be a plan for disaster management for every district of the State.

(*2*) The District Plan shall be prepared by the District Authority, after consultation with the local authorities and having regard to the National Plan and the State Plan, to be approved by the State Authority.

(*3*) The District Plan shall include—

(*a*) the areas in the district vulnerable to different forms of disasters;

(*b*) the measures to be taken, for prevention and mitigation of disaster, by the Departments of the Government at the district level and local authorities in the district;

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(*c*) the capacity-building and preparedness measures required to be taken by the Departments of the Government at the district level and the local authorities in the district to respond to any threatening disaster situation or disaster;

(*d*) the response plans and procedures, in the event of a disaster, providing for—

(*i*) allocation of responsibilities to the Departments of the Government at the district level and the local authorities in the district;

(*ii*) prompt response to disaster and relief thereof;

(*iii*) procurement of essential resources;

(*iv*) establishment of communication links; and

(*v*) the dissemination of information to the public;

(*e*) such other matters as may be required by the State Authority.

(*4*) The District Plan shall be reviewed and updated annually.

(*5*) The copies of the District Plan referred to in sub-sections (*2*) and (*4*) shall be made available to the Departments of the Government in the district.

(*6*) The District Authority shall send a copy of the District Plan to the State Authority which shall forward it to the State Government.

(*7*) The District Authority shall, review from time to time, the implementation of the Plan and issue such instructions to different departments of the Government in the district as it may deem necessary for the implementation thereof.

32. Plans by different authorities at district level and their implementation.—Every office of the Government of India and of the State Government at the district level and the local authorities shall, subject to the supervision of the District Authority,—

(*a*) prepare a disaster management plan setting out the following, namely:—

(*i*) provisions for prevention and mitigation measures as provided for in the District Plan and as is assigned to the department or agency concerned;

(*ii*) provisions for taking measures relating to capacity-building and preparedness as laid down in the District Plan;

(*iii*) the response plans and procedures, in the event of, any threatening disaster situation or disaster;

(*b*) coordinate the preparation and the implementation of its plan with those of the other organisations at the district level including local authority, communities and other stakeholders;

(*c*) regularly review and update the plan; and

(*d*) submit a copy of its disaster management plan, and of any amendment thereto, to the District Authority.

33. Requisition by the District Authority.—The District Authority may by order require any officer or any Department at the district level or any local authority to take such measures for the prevention or mitigation of disaster, or to effectively respond to it, as may be necessary, and such officer or department shall be bound to carry out such order.

34. Powers and functions of District Authority in the event of any threatening disaster situation or disaster.—For the purpose of assisting, protecting or providing relief to the community, in response to any threatening disaster situation or disaster, the District Authority may—

(*a*) give directions for the release and use of resources available with any Department of the Government and the local authority in the district;

(*b*) control and restrict vehicular traffic to, from and within, the vulnerable

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(*c*) control and restrict the entry of any person into, his movement within and departure from, a vulnerable or affected area;

(*d*) remove debris, conduct search and carry out rescue operations;

(*e*) provide shelter, food, drinking water and essential provisions, healthcare and services;

(*f*) establish emergency communication systems in the affected area;

(*g*) make arrangements for the disposal of the unclaimed dead bodies;

(*h*) recommend to any Department of the Government of the State or any authority or body under that Government at the district level to take such measures as are necessary in its opinion;

(*i*) require experts and consultants in the relevant fields to advise and assist as it may deem necessary;

(*j*) procure exclusive or preferential use of amenities from any authority or person;

(*k*) construct temporary bridges or other necessary structures and demolish structures which may be hazardous to public or aggravate the effects of the disaster;

(*l*) ensure that the non-governmental organisations carry out their activities in an equitable and non-discriminatory manner;

(*m*) take such other steps as may be required or warranted to be taken in such a situation.

CHAPTER V

MEASURES BY THE GOVERNMENT FOR DISASTER MANAGEMENT

35. Central Government to take measures.—(*1)* Subject to the provisions of this Act, the Central Government shall take all such measures as it deems necessary or expedient for the purpose of disaster management.

(*2*) In particular and without prejudice to the generality of the provisions of sub-section (*1*), the measures which the Central Government may take under that sub-section include measures with respect to all or any of the following matters, namely:—

(*a*) coordination of actions of the Ministries or Departments of the Government of India, State Governments, National Authority, State Authorities, governmental and non-governmental organisations in relation to disaster management;

(*b*) ensure the integration of measures for prevention of disasters and mitigation by Ministries or Departments of the Government of India into their development plans and projects;

(*c*) ensure appropriate allocation of funds for prevention of disaster, mitigation, capacity-building and preparedness by the Ministries or Departments of the Government of India;

(*d*) ensure that the Ministries or Departments of the Government of India take necessary measures for preparedness to promptly and effectively respond to any threatening disaster situation or disaster;

(*e*) cooperation and assistance to State Governments, as requested by them or otherwise deemed appropriate by it;

(*f*) deployment of naval, military and air forces, other armed forces of the Union or any other civilian personnel as may be required for the purposes of this Act;

(*g*) coordination with the United Nations agencies, international organisations and governments of foreign countries for the purposes of this Act;

(*h*) establish institutions for research, training, and developmental programmes in the field of disaster management;

(*i*) such other matters as it deems necessary or expedient for the purpose of securing effective implementation of the provisions of this Act.

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(*3*) The Central Government may extend such support to other countries affected by major disaster as it may deem appropriate.

36. Responsibilities of Ministries or Departments of Government of India.—It shall be the responsibility of every Ministry or Department of the Government of India to—

(*a*) take measures necessary for prevention of disasters, mitigation, preparedness and capacity-building in accordance with the guidelines laid down by the National Authority;

(*b*) integrate into its development plans and projects, the measures for prevention or mitigation of disasters in accordance with the guidelines laid down by the National Authority;

(*c*) respond effectively and promptly to any threatening disaster situation or disaster in accordance with the guidelines of the National Authority or the directions of the National Executive Committee in this behalf;

(*d*) review the enactments administered by it, its policies, rules and regulations, with a view to incorporate therein the provisions necessary for prevention of disasters, mitigation or preparedness;

(*e*) allocate funds for measures for prevention of disaster, mitigation, capacity-building and preparedness;

(*f*) provide assistance to the National Authority and State Governments for—

(*i*) drawing up mitigation, preparedness and response plans, capacity-building, data collection and identification and training of personnel in relation to disaster management;

(*ii*) carrying out rescue and relief operations in the affected area;

(*iii*) assessing the damage from any disaster;

(*iv*) carrying out rehabilitation and reconstruction;

(*g*) make available its resources to the National Executive Committee or a State Executive Committee for the purposes of responding promptly and effectively to any threatening disaster situation or disaster, including measures for—

(*i*) providing emergency communication in a vulnerable or affected area;

(*ii*) transporting personnel and relief goods to and from the affected area;

(*iii*) providing evacuation, rescue, temporary shelter or other immediate relief;

(*iv*) setting up temporary bridges, jetties and landing places;

(*v*) providing, drinking water, essential provisions, healthcare, and services in an affected area;

(*h*) take such other actions as it may consider necessary for disaster management.

37. Disaster management plans of Ministries or Departments of Government of India.—(*1*) Every Ministry or Department of the Government of India shall—

(*a)* prepare a disaster management plan specifying the following particulars, namely:—

(*i*) the measures to be taken by it for prevention and mitigation of disasters in accordance with the National Plan;

(*ii*) the specifications regarding integration of mitigation measures in its development plans in accordance with the guidelines of the National Authority and the National Executive Committee;

(*iii*) its roles and responsibilities in relation to preparedness and capacity-building to deal with any threatening disaster situation or disaster;

(*iv*) its roles and responsibilities in regard to promptly and effectively responding to any threatening disaster situation or disaster;

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(*v*) the present status of its preparedness to perform the roles and responsibilities specified in sub-clauses (*iii*) and (*iv*);

(*vi*) the measures required to be taken in order to enable it to perform its responsibilities specified in sub-clauses (*iii*) and (*iv*);

(*b*) review and update annually the plan referred to in clause (*a*);

(*c*) forward a copy of the plan referred to in clause (*a*) or clause (*b*), as the case may be, to the Central Government which Government shall forward a copy thereof to the National Authority for its approval.

(*2*) Every Ministry or Department of the Government of India shall—

(*a*) make, while preparing disaster management plan under clause (*a*) of sub-section (*1*), provisions for financing the activities specified therein;

(*b*) furnish a status report regarding the implementation of the plan referred to in clause (*a*) of sub-section (*1*) to the National Authority, as and when required by it.

38. State Government to take measures.—(*1*) Subject to the provisions of this Act, each State Government shall take all measures specified in the guidelines laid down by the National Authority and such further measures as it deems necessary or expedient, for the purpose of disaster management.

(*2*) The measures which the State Government may take under sub-section (*1*) include measures with respect to all or any of the following matters, namely:—

(*a*) coordination of actions of different departments of the Government of the State, the State Authority, District Authorities, local authority and other non-governmental organisations;

(*b*) cooperation and assistance in the disaster management to the National Authority and National Executive Committee, the State Authority and the State Executive Committee, and the District Authorities;

(*c*) cooperation with, and assistance to, the Ministries or Departments of the Government of India in disaster management, as requested by them or otherwise deemed appropriate by it;

(*d*) allocation of funds for measures for prevention of disaster, mitigation, capacity-building and preparedness by the departments of the Government of the State in accordance with the provisions of the State Plan and the District Plans;

(*e*) ensure that the integration of measures for prevention of disaster or mitigation by the departments of the Government of the State in their development plans and projects;

(*f*) integrate in the State development plan, measures to reduce or mitigate the vulnerability of different parts of the State to different disasters;

(*g*) ensure the preparation of disaster management plans by different departments of the State in accordance with the guidelines laid down by the National Authority and the State Authority;

(*h*) establishment of adequate warning systems up to the level of vulnerable communities;

(*i*) ensure that different departments of the Government of the State and the District Authorities take appropriate preparedness measures;

(*j*) ensure that in a threatening disaster situation or disaster, the resources of different departments of the Government of the State are made available to the National Executive Committee or the State Executive Committee or the District Authorities, as the case may be, for the purposes of effective response, rescue and relief in any threatening disaster situation or disaster;

(*k*) provide rehabilitation and reconstruction assistance to the victims of any disaster; and

(*l*) such other matters as it deems necessary or expedient for the purpose of securing effective implementation of provisions of this Act.

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39. Responsibilities of departments of the State Government.—It shall be the responsibility of every department of the Government of a State to—

(*a*) take measures necessary for prevention of disasters, mitigation, preparedness and capacity-building in accordance with the guidelines laid down by the National Authority and the State Authority;

(*b*) integrate into its development plans and projects, the measures for prevention of disaster and mitigation;

(*c*) allocate funds for prevention of disaster, mitigation, capacity-building and preparedness;

(*d*) respond effectively and promptly to any threatening disaster situation or disaster in accordance with the State Plan, and in accordance with the guidelines or directions of the National Executive Committee and the State Executive Committee;

(*e*) review the enactments administered by it, its policies, rules and regulations with a view to incorporate therein the provisions necessary for prevention of disasters, mitigation or preparedness;

(*f*) provide assistance, as required, by the National Executive Committee, the State Executive Committee and District Authorities, for—

(*i*) drawing up mitigation, preparedness and response plans, capacity-building, data collection and identification and training of personnel in relation to disaster management;

(*ii*) assessing the damage from any disaster;

(*iii*) carrying out rehabilitation and reconstruction;

(*g*) make provision for resources in consultation with the State Authority for the implementation of the District Plan by its authorities at the district level;

(*h*) make available its resources to the National Executive Committee or the State Executive Committee or the District Authorities for the purposes of responding promptly and effectively to any disaster in the State, including measures for—

(*i*) providing emergency communication with a vulnerable or affected area;

(*ii*) transporting personnel and relief goods to and from the affected area;

(*iii*) providing evacuation, rescue, temporary shelter or other immediate relief;

(*iv*) carrying out evacuation of persons or live-stock from an area of any threatening disaster situation or disaster;

(*v*) setting up temporary bridges, jetties and landing places;

(*vi*)providing drinking water, essential provisions, healthcare and services in an affected area;

(*i*) such other actions as may be necessary for disaster management.

40. Disaster management plan of departments of State.—(*1*) Every department of the State Government, in conformity with the guidelines laid down by the State Authority, shall—

(*a*) prepare a disaster management plan which shall lay down the following :—

(*i*) the types of disasters to which different parts of the State are vulnerable;

(*ii*) integration of strategies for the prevention of disaster or the mitigation of its effects or both with the development plans and programmes by the department;

(*iii*) the roles and responsibilities of the department of the State in the event of any threatening disaster situation or disaster and emergency support function it is required to perform;

(*iv*) present status of its preparedness to perform such roles or responsibilities or emergency support function under sub-clause (*iii*);

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(*v*) the capacity-building and preparedness measures proposed to be put into effect in order to enable the Ministries or Departments of the Government of India to discharge their responsibilities under section 37;

(*b*) annually review and update the plan referred to in clause (*a*); and

(*c*) furnish a copy of the plan referred to in clause (*a*) or clause (*b*), as the case may be, to the State Authority.

(*2*) Every department of the State Government, while preparing the plan under sub-section (*1*), shall make provisions for financing the activities specified therein.

(*3*) Every department of the State Government shall furnish an implementation status report to the State Executive Committee regarding the implementation of the disaster management plan referred to in sub-section (*1*).

CHAPTER VI

LOCAL AUTHORITIES

41. Functions of the local authority.—(*1*) Subject to the directions of the District Authority, a local authority shall—

(*a*) ensure that its officers and employees are trained for disaster management;

(*b*) ensure that resources relating to disaster management are so maintained as to be readily available for use in the event of any threatening disaster situation or disaster;

(*c*) ensure all construction projects under it or within its jurisdiction conform to the standards and specifications laid down for prevention of disasters and mitigation by the National Authority, State Authority and the District Authority;

(*d*) carry out relief, rehabilitation and reconstruction activities in the affected area in accordance with the State Plan and the District Plan.

(*2*) The local authority may take such other measures as may be necessary for the disaster management.

CHAPTER VII

NATIONAL INSTITUTEOF DISASTER MANAGEMENT

42. National Institute of Disaster Management.—(*1*) With effect from such date as the Central Government may, by notification in the Official Gazette appoint in this behalf, there shall be constituted an institute to be called the National Institute of Disaster Management.

(*2*) The National Institute of Disaster Management shall consist of such number of members as may be prescribed by the Central Government.

(*3*) The term of office of, and vacancies among, members of the National Institute of Disaster Management and manner of filling such vacancies shall be such as may be prescribed.

(*4*) There shall be a governing body of the National Institute of Disaster Management which shall be constituted by the Central Government from amongst the members of the National Institute of Disaster Management in such manner as may be prescribed.

(*5*) The governing body of the National Institute of Disaster Management shall exercise such powers and discharge such functions as may be prescribed by regulations.

(*6*) The procedure to be followed in exercise of its powers and discharge of its functions by the governing body, and the term of office of, and the manner of filling vacancies among the members of the governing body, shall be such as may be prescribed by regulations.

(*7*) Until the regulations are made under this section, the Central Government may make such regulations; and any regulation so made may be altered or rescinded by the National Institute of Disaster Management in exercise of its powers.

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(*8*) Subject to the provisions of this Act, the National Institute of Disaster Management shall function within the broad policies and guidelines laid down by the National Authority and be responsible for planning and promoting training and research in the area of disaster management, documentation and development of national level information base relating to disaster management policies, prevention mechanisms and mitigation measures.

(*9*) Without prejudice to the generality of the provisions contained in sub-section (*8*), the National Institute, for the discharge of its functions, may—

(*a*) develop training modules, undertake research and documentation in disaster management and organise training programmes;

(*b*) formulate and implement a comprehensive human resource development plan covering all aspects of disaster management;

(*c*) provide assistance in national level policy formulation;

(*d*) provide required assistance to the training and research institutes for development of training and research programmes for stakeholders including Government functionaries and undertake training of faculty members of the State level training institutes;

(*e*) provide assistance to the State Governments and State training institutes in the formulation of State level policies, strategies, disaster management framework and any other assistance as may be required by the State Governments or State training institutes for capacity-building of stakeholders, Government including its functionaries, civil society members, corporate sector and people's elected representatives;

(*f*) develop educational materials for disaster management including academic and professional courses;

(*g*) promote awareness among stakeholders including college or school teachers and students, technical personnel and others associated with multi-hazard mitigation, preparedness and response measures;

(*h*) undertake, Organise and facilitate study courses, conferences, lectures, seminars within and outside the country to promote the aforesaid objects;

(*i*) undertake and provide for publication of journals, research papers and books and establish and maintain libraries in furtherance of the aforesaid objects;

(*j*) do all such other lawful things as are conducive or incidental to the attainment of the above objects; and

(*k*) undertake any other function as may be assigned to it by the Central Government.

43. Officers and other employees of the National Institute.—The Central Government shall provide the National Institute of Disaster Management with such officers, consultants and other employees, as it considers necessary, for carrying out its functions.

CHAPTER VIII

NATIONAL DISASTER RESPONSE FORCE

44. National Disaster Response Force.—(*1*) There shall be constituted a National Disaster Response Force for the purpose of specialist response to a threatening disaster situation or disaster.

(*2*) Subject to the provisions of this Act, the Force shall be constituted in such manner and, the conditions of service of the members of the Force, including disciplinary provisions therefore, be such as may be prescribed.

45. Control, direction, etc.—The general superintendence, direction and control of the Force shall be vested and exercised by the National Authority and the command and supervision of the Force shall vest in an officer to be appointed by the Central Government as the Director General of the National Disaster Response Force.

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CHAPTER IX

FINANCE, ACCOUNTS AND AUDIT

46. National Disaster Response Fund.—(*1*) The Central Government may, by notification in the Official Gazette, constitute a fund to be called the National Disaster Response Fund for meeting any threatening disaster situation or disaster and there shall be credited thereto—

(*a*) an amount which the Central Government may, after due appropriation made by Parliament by law in this behalf provide;

(*b*) any grants that may be made by any person or institution for the purpose of disaster management.

(*2*) The National Disaster Response Fund shall be made available to the National Executive Committee to be applied towards meeting the expenses for emergency response, relief and rehabilitation in accordance with the guidelines laid down by the Central Government in consultation with the National Authority.

47. National Disaster Mitigation Fund.—(*1*) The Central Government may, by notification in the Official Gazette, constitute a Fund to be called the National Disaster Mitigation Fund for projects exclusively for the purpose of mitigation and there shall be credited thereto such amount which the Central Government may, after due appropriation made by Parliament by law in this behalf, provide.

(*2*) The National Disaster Mitigation Fund shall be applied by the National Authority.

48. Establishment of funds by State Government.—(*1*) The State Government shall, immediately after notifications issued for constituting the State Authority and the District Authorities, establish for the purposes of this Act the following funds, namely:—

(*a*) the fund to be called the State Disaster Response Fund;

(*b*) the fund to be called the District Disaster Response Fund;

(*c*) the fund to be called the State Disaster Mitigation Fund;

(*d*) the fund to be called the District Disaster Mitigation Fund.

(*2*) The State Government shall ensure that the funds established—

(*i*) under clause (*a*) of sub-section *(1*) is available to the State Executive Committee;

(*ii*) under sub-clause (*c*) of sub-section (*1*) is available to the State Authority;

(*iii*) under clauses (*b*) and (*d*) of sub-section (*1*) are available to the District Authority.

49. Allocation of funds by Ministries and Departments.—(*1*) Every Ministry or Department of the Government of India shall make provisions, in its annual budget, for funds for the purposes of carrying out the activities and programmes set out in its disaster management plan.

(*2*) The provisions of sub-section (*1*) shall, *mutatis mutandis*, apply to departments of the Government of the State.

50. Emergency procurement and accounting.—Where by reason of any threatening disaster situation or disaster, the National Authority or the State Authority or the District Authority is satisfied that immediate procurement of provisions or materials or the immediate application of resources are necessary for rescue or relief,—

(*a*) it may authorise the concerned department or authority to make the emergency procurement and in such case, the standard procedure requiring inviting of tenders shall be deemed to be waived;

(*b*) a certificate about utilisation of provisions or materials by the controlling officer authorised by the National Authority, State Authority or District Authority, as the case may be, shall be deemed to be a valid document or voucher for the purpose of accounting of emergency, procurement of such provisions or materials.

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CHAPTER X

OFFENCES AND PENALTIES

51. Punishment for obstruction, etc.—Whoever, without reasonable cause—

(*a*) obstructs any officer or employee of the Central Government or the State Government, or a person authorised by the National Authority or State Authority or District Authority in the discharge of his functions under this Act; or

(*b*) refuses to comply with any direction given by or on behalf of the Central Government or the State Government or the National Executive Committee or the State Executive Committee or the District Authority under this Act,

shall on conviction be punishable with imprisonment for a term which may extend to one year or with fine, or with both, and if such obstruction or refusal to comply with directions results in loss of lives or imminent danger thereof, shall on conviction be punishable with imprisonment for a term which may extend to two years.

52. Punishment for false claim.—Whoever knowingly makes a claim which he knows or has reason to believe to be false for obtaining any relief, assistance, repair, reconstruction or other benefits consequent to disaster from any officer of the Central Government, the State Government, the National Authority, the State Authority or the District Authority, shall, on conviction be punishable with imprisonment for a term which may extend to two years, and also with fine.

53. Punishment for misappropriation of money or materials, etc.—Whoever, being entrusted with any money or materials, or otherwise being, in custody of, or dominion over, any money or goods, meant for providing relief in any threatening disaster situation or disaster, misappropriates or appropriates for his own use or disposes of such money or materials or any part thereof or wilfully compels any other person so to do, shall on conviction be punishable with imprisonment for a term which may extend to two years, and also with fine.

54. Punishment for false warning.—Whoever makes or circulates a false alarm or warning as to disaster or its severity or magnitude, leading to panic, shall on conviction, be punishable with imprisonment which may extend to one year or with fine.

55. Offences by Departments of the Government.—(*1*) Where an offence under this Act has been committed by any Department of the Government, the head of the Department shall be deemed to be guilty of the offence and shall be liable to be proceeded against and punished accordingly unless he proves that the offence was committed without his knowledge or that he exercised all due diligence to prevent the commission of such offence.

(*2*) Notwithstanding anything contained in sub-section (*1*), where an offence under this Act has been committed by a Department of the Government and it is proved that the offence has been committed with the consent or connivance of, or is attributable to any neglect on the part of, any officer, other than the head of the Department, such officer shall be deemed to be guilty of that offence and shall be liable to be proceeded against and punished accordingly.

56. Failure of officer in duty or his connivance at the contravention of the provisions of this Act.—Any officer, on whom any duty has been imposed by or under this Act and who ceases or refuses to perform or withdraws himself from the duties of his office shall, unless he has obtained the express written permission of his official superior or has other lawful excuse for so doing, be punishable with imprisonment for a term which may extend to one year or with fine.

57. Penalty for contravention of any order regarding requisitioning.—If any person contravenes any order made under section 65, he shall be punishable with imprisonment for a term which may extend to one year or with fine or with both.

58. Offence by companies.—(*1*) Where an offence under this Act has been committed by a company or body corporate, every person who at the time the offence was committed, was in charge of, and was responsible to, the company, for the conduct of the business of the company, as well as the company,

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shall be deemed to be guilty of the contravention and shall be liable to be proceeded against and punished accordingly:

Provided that nothing in this sub-section shall render any such person liable to any punishment provided in this Act, if he proves that the offence was committed without his knowledge or that he exercised due diligence to prevent the commission of such offence.

(*2*) Notwithstanding anything contained in sub-section (*1*), where an offence under this Act has been committed by a company, and it is proved that the offence was committed with the consent or connivance of or is attributable to any neglect on the part of any director, manager, secretary or other officer of the company, such director, manager, secretary or other officer shall also, be deemed to be guilty of that offence and shall be liable to be proceeded against and punished accordingly.

Explanation.—For the purpose of this section—

(*a*) "company" means any body corporate and includes a firm or other association of individuals; and

(*b*) "director", in relation to a firm, means a partner in the firm.

59. Previous sanction for prosecution.—No prosecution for offences punishable under sections 55 and 56 shall be instituted except with the previous sanction of the Central Government or the State Government, as the case may be, or of any officer authorised in this behalf, by general or special order, by such Government.

60. Cognizance of offences.—No court shall take cognizance of an offence under this Act except on a complaint made by—

(*a*) the National Authority, the State Authority, the Central Government, the State Government, the District Authority or any other authority or officer authorised in this behalf by that Authority or Government, as the case may be; or

(*b*) any person who has given notice of not less than thirty days in the manner prescribed, of the alleged offence and his intention to make a complaint to the National Authority, the State Authority, the Central Government, the State Government, the District Authority or any other authority or officer authorised as aforesaid.

CHAPTER XI

MISCELLANEOUS

61. Prohibition against discrimination.—While providing compensation and relief to the victims of disaster, there shall be no discrimination on the ground of sex, caste, community, descent or religion.

62. Power to issue direction by Central Government.—Notwithstanding anything contained in any other law for the time being in force, it shall be lawful for the Central Government to issue direction in writing to the Ministries or Departments of the Government of India, or the National Executive Committee or the State Government, State Authority, State Executive Committee, statutory bodies or any of its officers or employees, as the case may be, to facilitate or assist in the disaster management and such Ministry or Department or Government or Authority, Executive Committee, statutory body, officer or employee shall be bound to comply with such direction.

63. Powers to be made available for rescue operations.—Any officer or authority of the Union or a State, when requested by the National Executive Committee, any State Executive Committee or District Authority or any person authorised by such Committee or Authority in this behalf, shall make available to that Committee or authority or person, such officers and employees as requested for, to perform any of the functions in connection with the prevention of disaster or mitigation or rescue or relief work.

64. Making or amending rules, etc., in certain circumstances.—Subject to the provisions of this Act, if it appears to the National Executive Committee, State Executive Committee or the District Authority, as the case may be, that provisions of any rule, regulation, notification, guideline, instruction, order, scheme or bye-laws, as the case may be, are required to be made or amended for the purposes of prevention of disasters or the mitigation thereof, it may require the amendment of such [illegible]ation.

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notification, guidelines, instruction, order, scheme or bye-laws, as the case may be, for that purpose, and the appropriate department or authority shall take necessary action to comply with the requirements.

65. Power of requisition of resources, provisions, vehicles, etc., for rescue operations, etc.—(*1*) If it appears to the National Executive Committee, State Executive Committee or District Authority or any officer as may be authorised by it in this behalf that—

(*a*) any resources with any authority or person are needed for the purpose of prompt response;

(*b*) any premises are needed or likely to be needed for the purpose of rescue operations; or

(*c*) any vehicle is needed or is likely to be needed for the purposes of transport of' resources from disaster affected areas or transport of resources to the affected area or transport in connection with rescue, rehabilitation or reconstruction,

such authority may, by order in writing, requisition such resources or premises or such vehicle, as the case may be, and may make such further orders as may appear to it to be necessary or expedient in connection with the requisitioning.

(*2*) Whenever any resource, premises or vehicle is requisitioned under sub-section (*1*), the period of such requisition shall not extend beyond the period for which such resource, premises or vehicle is required for any of the purposes mentioned in that sub-section.

(*3*) In this section,—

(*a*) "resources" includes men and material resources;

(*b*) "services" includes facilities;

(*c*) "premises" means any land, building or part of a building and includes a hut, shed or other structure or any part thereof;

(*d*) "vehicle" means any vehicle used or capable of being used for the purpose of transport, whether propelled by mechanical power or otherwise.

66. Payment of compensation.— (*1*) Whenever any Committee, Authority or officer referred to in sub-section (*1*) of section 65, in pursuance of that section requisitions any premises, there shall be paid to the persons interested compensation the amount of which shall be determined by taking into consideration the following, namely:—

(*i*) the rent payable in respect of the premises, or if no rent is so payable, the rent payable for similar premises in the locality;

(*ii*) if as consequence of the requisition of the premises the person interested is compelled to change his residence or place of business, the reasonable expenses (if any) incidental to such change:

Provided that where any person interested being aggrieved by the amount of compensation so determined makes an application within the thirty days to the Central Government or the State Government, as the case may be, for referring the matter to an arbitrator, the amount of compensation to be paid shall be such as the arbitrator appointed in this behalf by the Central Government or the State Government, as the case may be, may determine:

Provided further that where there is any dispute as to the title to receive the compensation or as to the apportionment of the amount of compensation, it shall be referred by the Central Government or the State Government, as the case may be, to an arbitrator appointed in this behalf by the Central Government or the State Government, as the case may be, for determination, and shall be determined in accordance with the decision of such arbitrator.

*Explanatio*n.—In this sub-section, the expression "person interested" means the person who was in actual possession of the premises requisitioned under section 65 immediately before the requisition, or where no person was in such actual possession, the owner of such premises.

(*2*) Whenever any Committee, Authority or officer, referred to in sub-section (*1*) of section 65 in pursuance of that section requisitions any vehicle, there shall be paid to the owner thereof compensation the mount of which shall be determined by the Central Government or the State Government, as the case may be, on the basis of the fares or rates prevailing in the locality for the hire of su

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Provided that where the owner of such vehicle being aggrieved by the amount of compensation so determined makes an application within the prescribed time to the Central Government or the State Government, as the case may be, for referring the matter to an arbitrator, the amount of compensation to be paid shall be such as the arbitrator appointed in this behalf by the Central Government or the State Government, as the case may be, may determine:

Provided further that where immediately before the requisitioning the vehicle or vessel was by virtue of a hire purchase agreement in the possession of a person other than the owner, the amount determined under this sub-section as the total compensation payable in respect of the requisition shall be apportioned between that person and the owner in such manner as they may agree upon, and in default of agreement, in such manner as an arbitrator appointed by the Central Government or the State Government, as the case may be, in this behalf may decide.

67. Direction to media for communication of warnings, etc.—The National Authority, the State Authority, or a District Authority may recommend to the Government to give direction to any authority or person in control of any audio or audio-visual media or such other means of communication as may be available to carry any warning or advisories regarding any threatening disaster situation or disaster, and the said means of communication and media as designated shall comply with such direction.

68. Authentication of orders or decisions.—Every order or decision of the National Authority or the National Executive Committee, the State Authority, or the State Executive Committee or the District Authority, shall be authenticated by such officers of the National Authority or the National Executive Committee or, the State Executive Committee, or the District Authority, as may be authorised by it in this behalf.

69. Delegation of powers.—The National Executive Committee, State Executive Committee, as the case may be, by general or special order in writing, may delegate to the Chairperson or any other member or to any officer, subject to such conditions and limitations, if any, as may be specified in the order, such of its powers and functions under this Act as it may deem necessary.

70. Annual report.—(*1*) The National Authority shall prepare once every year, in such form and at such time as may be prescribed, an annual report giving a true and full account of its activities during the previous year and copies thereof shall be forwarded to the Central Government and that Government shall cause the same to be laid before both Houses of Parliament within one month of its receipt.

(*2*) The State Authority shall prepare once in every year, in such form and at such time as may be prescribed, an annual report giving a true and full account of its activities during the previous year and copies thereof shall be forwarded to the State Government and that Government shall cause the same to be laid before each House of the State Legislature where it consists of two Houses, or where such Legislature consists of one House, before that House.

71. Bar of jurisdiction of court.—No court (except the Supreme Court or a High Court) shall have jurisdiction to entertain any suit or proceeding in respect of anything done, action taken, orders made, direction, instruction or guidelines issued by the Central Government, National Authority, State Government, State Authority or District Authority in pursuance of any power conferred by, or in relation to its functions, by this Act.

72. Act to have overriding effect.—The provisions of this Act, shall have effect, notwithstanding anything inconsistent therewith contained in any other law for the time being in force or in any instrument having effect by virtue of any law other than this Act.

73. Action taken in good faith.—No suit or prosecution or other proceeding shall lie in any court against the Central Government or the National Authority or the State Government or the State Authority or the District Authority or local authority or any officer or employee of the Central Government or the National Authority or the State Government or the State Authority or the District Authority or local authority or any person working for on behalf of such Government or authority in respect of any work done or purported to have been done or intended to be done in good faith by such authority or Government or such officer or employee or such person under the provisions of this Act or the rules or regulations made thereunder.

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74. Immunity from legal process.—Officers and employees of the Central Government, National Authority, National Executive Committee, State Government, State Authority, State Executive Committee or District Authority shall be immune from legal process in regard to any warning in respect of any impending disaster communicated or disseminated by them in their official capacity or any action taken or direction issued by them in pursuance of such communication or dissemination.

75. Power of Central Government to make rules.—(*1*) The Central Government may, by notification in the Official Gazette, make rules for carrying out the purposes of this Act.

(*2*) In particular, and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters, namely:—

(*a*) the composition and number of the members of the National Authority under sub-section (*2*), and the term of office and conditions of service of members of the National Authority under sub-section (*4*), of section 3;

(*b*) the allowances to be paid to the members of the advisory committee under sub-section (*2*) of section 7;

(*c*) the powers and functions of the Chairperson of the National Executive Committee under sub-section (*3*) of section 8 and the procedure to be followed by the National Executive Committee in exercise of its powers and discharge of its functions under sub-section (*4*) of section 8;

(*d*) allowances to be paid to the persons associated with the sub-committee constituted by the National Executive Committee under sub-section (*3*) of section 9;

(*e*) the number of members of the National Institute of Disaster Management under sub-section (*2*), the term of the office and vacancies among members and the manner of filling such vacancies under sub-section (*3*) and the manner of constituting the Governing Body of the National Institute of Disaster Management under sub-section (*4*) of section 42;

(*f*) the manner of constitution of the Force, the conditions of service of the members of the Force, including disciplinary provisions under sub-section (*2*) of section 44;

(*g*) the manner in which notice of the offence and of the intention to make a complaint to the National Authority, the State Authority, the Central Government, the State Government or the other authority or officer under clause (*b*) of section 60;

(*h*) the form in which and the time within which annual report is to be prepared under section 70;

(*i*) any other matter which is to be, or may be, prescribed, or in respect of which provision is to be made by rules.

76. Power to make regulations.—(*1*) The National Institute of Disaster Management, with the previous approval of the Central Government may, by notification in the Official Gazette, make regulations consistent with this Act and the rules made thereunder to carry out the purposes of this Act.

(*2*) In particular, and without prejudice to the generality of the foregoing power, such regulations may provide for all or any of the following matters, namely:—

(*a*) powers and functions to be exercised and discharged by the governing body;

(*b*) procedure to be followed by the governing body in exercise of the powers and discharge of its functions;

(*c*) any other matter for which under this Act provision may be made by the regulations.

77. Rules and regulations to be laid before Parliament.—Every rule made by the Central Government and every regulation made by the National Institute of Disaster Management under this Act shall be laid, as soon as may be after it is made, before each House of Parliament, while it is in session, for a total period of thirty days which may be comprised of one session or in two or more successive sessions, and if, before the expiry of the session immediately following the session or the successive sessions aforesaid, both Houses agree in making any modification in the rule or regulation or both Houses agree that the rule or regulation should not be made, the rule or regulation shall thereafter

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in such modified form or be of no effect, as the case may be; so, however, that any such modification or annulment shall be without prejudice to the validity of anything previously done under that rule or regulation.

78. Power of State Government to make rules.—(*1*) The State Government may, by notification in the Official Gazette, make rules to carry out the provisions of this Act.

(*2*) In particular, and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters, namely:—

(*a*) the composition and number of the members of the State Authority under sub-section (*2*), and the term of office and conditions of service of the members of the State Authority under sub-section (*5*), of section 14;

(*b*) the allowances to be paid to the members of the advisory committee under sub-section (*2*) of section 17;

(*c*) the powers and functions of the Chairperson of the State Executive Committee under sub-section (*3*), and the procedure to be followed by the State Executive Committee in exercise of its powers and discharge of its functions under sub-section (*4*) of section 20;

(*d*) allowances to be paid to the persons associated with the sub-committee constituted by the State Executive Committee under sub-section (*3*) of section 21;

(*e*) the composition and the number of members of the District Authority under sub-section (*2*), and the powers and functions to be exercised and discharged by the Chief Executive Officer of the District Authority under sub-section (*3*) of section 25;

(*f*) allowances payable to the persons associated with any committee constituted by the District Authority as experts under sub-section (*3*) of section 28;

(*g*) any other matter which is to be, or may be, prescribed, or in respect of which provision is to be made by rules.

(*3*) Every rule made by the State Government under this Act shall be laid, as soon as may be after it is made, before each House of the State Legislature where it consists of two Houses, or where such Legislature consists of one House before that House.

79. Power to remove difficulties.—(*1*) If any difficulty arises in giving effect to the provisions of this Act, the Central Government or the State Government, as the case may be, by notification in the Official Gazette, make order not inconsistent with the provisions of this Act as may appear to it to be necessary or expedient for the removal of the difficulty:

Provided that no such order shall be made after the expiration of two years from the commencement of this Act.

(*2*) Every order made under this section shall be laid, as soon as may be after it is made, before each House of Parliament or the Legislature, as the case may be.

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NATIONAL MEDICAL COMMISSION

COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE

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Describe Enumerate Observe Demonstrate Assist

Counsel Prescribe

Analyse Integrate

Guide Communicate

Correlate Interpret

Critique Collaborate



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How to cite: National Medical Commission. Module on Online learning and assessment. 2020. New Delhi: pp 1- 57.

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Foreword
Online learning and Assessment

The COVID- 19 pandemic in many ways has challenged educators to innovate and ensure that the medical students are able to continue their learning during a situation that has placed an unprecedented strain on the medical education system. Creating a learning experience that allows learners to accomplish the required competency online, many of which are skill and attitude based, is a tough ask. Despite this, many institutions have risen to the challenge and displayed ingenuity in creating a learning environment that fulfils many of the demands of medical education.

Online learning, while not without its drawbacks, has some significant strengths that warrant its continuation in some form beyond these tough times. Flexible learning opportunities, greater learner involvement, impetus to self-directed and collaborative learning are some of the obvious strengths of online learning. Blended learning is going to be the future of medical education.

This module prepared by the Expert Group with inputs from outside experts is a primer of how to improvise at times of necessity and demand. It provides guidance to Curriculum Committee of medical colleges and to the teachers on how to use the online medium to help learners achieve many of the stated competencies including procedural skills and Attitude, Ethics and Communication skills which are traditionally considered not amenable to distance learning. Many of these modalities require very little monetary investment. Wherever possible - low cost alternatives to paid premium platforms - such as open access and free to use resources have been outlined.

Online medical education is nascent - and is fertile with innovations happening in all the medical institutions in the country. I request all the institutions in the country to share their best practices in a spirit of collaboration and ensure that our students get to learn in an environment - real or virtual - that best allows them to fulfil their aspirations. I am grateful to the Expert Group for preparing this learning module on Online learning and assessment which is of current relevance.

Chairman
National Medical Commission

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राष्ट्रीय आयुर्विज्ञान आयोग
National Medical Commission

Foreword
Online learning and Assessment

The implementation of the new competency based Undergraduate curriculum across medical colleges in India required training of medical college teachers in the various changes built into this outcome-driven new curriculum, year-wise. To achieve this, the Expert Group, advising academic matters, developed a sequential step-wise Curriculum Implementation Support Program (CISP) which included a number of training modalities like Faculty Guides, Learning Resource materials and in-situ training of teaching faculty of colleges through a multi-tier Faculty Development Program. The successful implementation of CISP I in the first year of teaching of the new UG curriculum was a major achievement.

The COVID-19 outbreak in early 2020 posed a major setback to our efforts to train medical college faculty on the changes incorporated in the second year of the new UG curriculum wherein the major challenge of horizontal and vertical integration of curricula were built in,in addition to new teaching learning modalities like Learner-doctor method of clinical training (Clinical Clerkship). This challenge forced the Academic cell and the Expert Group advising the National Medical Commission to explore Online teaching-learning and assessment modalities. This module on Online learning and Assessment is the outcome of these efforts and provides valuable and much needed information to medical college faculty. I hope the information contained herein will be useful to students, teachers and institutions interested in virtual teaching.

Secretary
National Medical Commission

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Module on
Online
Learning and Assessment

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Glossary

AETCOM: Attitude, Ethics and Communication module introduced into its Faculty Development Program by the Medical Council of India in 2015 for undergraduate medical education.

Asynchronous learning: A learning event in which teachers and students participate at different times. Generally, there is no real-time interaction between the teacher and the students.

Blended learning: Learning which integrates online learning with conventional face-to-face (f2f) teaching. Also called **'hybrid learning'**.

Distance learning: A form of remote teaching-learning method where media replaces word of mouth as the sole means of academic communication. There is often a spatial distance between the teacher and the student.

E-learning: Teaching-learning which is delivered using electronic resources. The teacher and the student may be within the same classroom or at a remote location.

Flipped classroom: An approach where the conventional sequence of teaching-learning activities is reversed. Students read the material at home *before the class* and then use the classroom time to discuss, clarify concepts, create and apply knowledge.

Online Learning: Teaching-learning interactions which take place over the internet. This term is conventionally used for learning that happens across a distance. Learning can happen either partially or purely through the internet.

Pedagogy: Theory and practice of education.

Synchronous learning: A learning event in which teachers and learners engage at the same time. The place may be same or different. It is conventionally used in the context of online learning.

Disclaimer

Mention of/or example of a technology, platform or app for online teaching and assessment is not to be seen as an endorsement of the same.

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Introduction to online learning

The Covid-19 pandemic has dramatically changed the medical education environment and made the shift to online learning inevitable. Close human contact that was the essence of clinical teaching now looks so distant. The current coronavirus pandemic has forced us to explore non-conventional ways of teaching-learning and assessment. Medical schools will now need to be prepared to train the next generation of digital learners using virtual learning environments. This does not mean that traditional classroom teaching will become obsolete, but there is now an opportunity to use both methods efficiently in a hybrid manner, to make the process of learning efficient and effective.[1]

Though online learning has been in vogue for many years now, its application in medical education, especially in India, is rather new. Some teachers have had the experience of online learning – some as facilitators, and others as 'students' – during earlier faculty development interventions[2-3]; but its use for undergraduate education is a relatively new phenomenon.

The 'theory' of online learning is more or less the same when compared to face-to-face (f2f) instruction, but there are subtle differences and similarities. The educational cycle, the learning processes, need for interactivity, integration, assessment and feedback are similar in both formats. The use of technology, the spatial distance between the teacher and students, and learner isolation stand out as prominent differences.

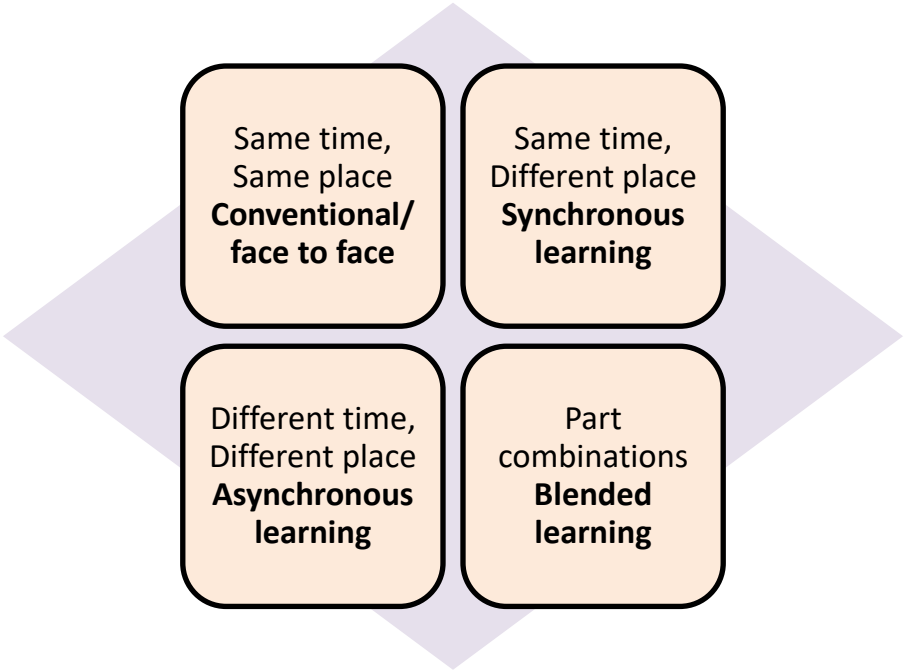
Different people have different ideas, interpretations and perspectives about online learning. Depending on the purpose, technology, context and institution, various terms such as e-learning, distance learning, web-based learning, web-facilitated learning, virtual learning, internet learning, distributed learning, computer-based learning, and technology-based learning have been used rather loosely and interchangeably to denote non face-to-face (f2f) learning.[4-7]

Means et al[8] define online learning as "*'learning that occurs entirely (purely online learning) or partially (blended learning) through the internet"* and this is the definition we are going to use in the context of this module.

The most accepted typology of online learning is given in Figure 1.

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Fig.1: Typology of online learning (Modified from Coldeway, 1995)[9]



Blended learning is a teaching-learning format where the facilitator effectively integrates the online teaching component with face-to-face sessions. For the purpose of this module, blended learning has been taken as: *"Seamless integration of traditional face to face learning with online activities to enhance the learning experience".*

Online learning: What works, what doesn't

Several factors influence the effectiveness of online learning. These factors include technical skills, academic skills, learner motivation, administrative issues, social interaction, time management, technical problems, cost, and accessibility to the internet.[10] Poor design of courses and inadequate availability of multimedia materials could affect the quality of online training. Online learning has been reported to be as effective as didactic teaching. It can also be instrumental in promoting self-directed learning. Learners can have greater control over their learning as they can go over the content at their own pace. Teachers too can evaluate competencies through online assessments and provide learners feedback for self-improvement.

If faculty in higher education are not adequately trained in educational methods, the problem of ineffective teaching gets exaggerated during online sessions as it has special requirements.[11] Online teaching requires a learner-centered approach, where teachers

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need to be competent in using principles of pedagogy, constructive and transformative learning, and assessment and feedback.[12]

Online learning formats

Online learning platforms now offer many opportunities that are being widely used around the world, such as online videos, tutorials, webcasts, video-conferences and virtual simulations. Online teaching-learning can be implemented through **synchronous** or **asynchronous modes**.

The range of available choices for real-time communication extends from online discussion spaces to online chat rooms to online meeting applications. Classroom lectures have now been replaced by live-streamed online lectures, where technology allows recording and online dissemination. Small group discussions and tutorials have been replaced with interactive webinars using online platforms. Almost all these learning resources can also be easily accessed using smartphones.

Information or learning resources can be posted on online platforms, such as websites and blogs. Videos can be shared to demonstrate essential clinical skills, procedural skills or communication skills. Lectures, problem-based learning, simulated lab work, sessions using virtual patients, and discussions can be conducted online, both in synchronous and asynchronous mode. All of these, if used effectively, can build in student engagement and interaction.

Online learning offers flexible learning experiences and allows learners the freedom to experiment with learning at their own pace. It is however not a replacement for f2f teaching.[13] It is initially expensive to set up and requires familiarity with technology.[14]

What the future holds for online learning in India

Although the recent surge in use of online learning has been propelled by the Covid-19 pandemic, it is likely to be adopted as a regular part of teaching and learning in the future as well. Furthermore, newer modes of health care delivery are evolving with rapid advances in information technology. Online learning promises to play a major role in this backdrop.

The recently introduced, competency-based curriculum in India already advocates use of e-learning as a tool for encouraging self-directed learning among students. The CBME document of Medical Council of India (2018)[15] recommends e-learning at the following junctures:

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Table 1: Emphasis on online learning in the recently introduced competency-based curriculum

- As a lifelong learner, the Indian Medical Graduate is expected to "*demonstrate ability to search (including through electronic means), and critically evaluate the medical literature and apply the information in the care of the patient*"
- One of the objectives of Foundation Course is to "*to enable the learner to acquire enhanced skills in use of information technology*"
- The new curriculum has reserved time for self-directed learning during every phase of the MBBS course
- The document recommends mandatory provision of skills laboratory in every medical college
- It also recommends mandatory provision of virtual lecture theatres

In addition, medical students also need to develop certain skills, collectively called 21st century skills[16] to fully benefit from online instruction. They need to have digital literacy skills. While students in general are comfortable working with computers and other digital platforms, a deliberate effort must be made to inculcate information technology related literacy, which includes, accessing information, evaluating it critically, and its application to address a given problem. Readers would recall that the Foundation Course introduced from 2019 admissions tried to address many of these issues.

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The Pedagogy of Online Learning

Pedagogical approaches which are used for face to face (f2f) teaching might not work if replicated in online settings. It is time to re-conceptualize pedagogical approaches for online teaching.[17]

Table 2: Pedagogical approaches to be used in online learning

1. *Online learning must not be restricted to delivery of information:* Online methods should not merely be used as tools to distribute teachers' notes or PowerPoint slides.

2. *Online tools must be used to innovate and create knowledge*: Online teaching must address higher-order cognitive skills. It must promote creativity, innovation, critical thinking and problem-solving skills in undergraduate medical students.

3. *Online tools must be explored to teach all domains*: Ways and means to teach psychomotor skills, communication skills, ethics, and medical humanities via online mode must be explored.

4. *Online approaches used must encourage participation and collaboration*: Online learning must be conducted through 'involvement' and 'inclusiveness' of the learners. This will also reduce learner isolation.

5. *Feedback, support and mentoring of learners must be carried out:* Learners in online sessions need more interactivity, mentoring, support, feedback and evaluation than the traditional classrooms. Communication between facilitators and learners must be encouraged.

6. *Online teaching must be supplemented by online assessment:* Periodic formative and summative assessment must be built into online courses.

7. *Quality assurance of online teaching and learning must be monitored:* Quality assurance in online teaching must be adopted within the institutional policy document.

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Building student engagement online

Here are some tips for building learner engagement in online sessions which work both in synchronous and asynchronous modes:

a. **Allow students to do most of the work**: It is important to give students time to engage and interact with the content. Student should be taught to take up responsibility for their own learning. This must be supplemented by facilitating discussions amongst students, and by giving them collaborative projects.
b. **Interactivity is the heart and soul of effective learning**: Students must be given opportunities to interact with the content, teacher, peers, environment and context; and
c. **Strive for presence**: Teachers should strive to ensure the following three types of presence in their online sessions:

Table 3:

Enhancing effectiveness of online teaching by ensuring cognitive, teaching and social presence

Type of presence	Examples
Cognitive presence (Related to content)	• Select suitable content • Arrange from simple to complex • Introduce content in bite-sized modules • Introducing conceptual and theoretical knowledge into discussions
Teaching presence (Related to instructor)	• Facilitating discussions • Acknowledge and encourage students' contribution • Identify areas of agreement and disagreement • Respond to technical concerns • Set the appropriate climate for learning
Social presence (Related to interaction)	• Allow students to express emotions • Ask for evidence of reading, thinking and understanding others' responses • Build cohesiveness amongst learners by given group work and allowing student-student interactions

(Adapted from Garrison et al[18], and Pelz[19])

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Good Online Teaching Practices

The principles for good teaching offline[20-21] and online[1] have been enlisted in literature. These principles reflect the basic premise of alignment between objectives, teaching-learning and assessment methods, need to promote interactivity, use of assessment, feedback, collaborative work, self-directed learning and promotion of higher order thinking skills using online pedagogical approaches.

Table 4: Good Online Teaching Practices

Principle 1: *Teaching-learning methods must match curricular objectives and assessment*
Online pedagogy must be aligned with clear learning objectives, meaningfulness of content covered, the appropriateness of student activities, and the type of assessment.

Principle 2: *Synchronous and asynchronous teacher-student interaction must be encouraged*
Create supportive and non-threatening online environment. Open synchronous and asynchronous communication channels to encourage students to complete their work. This results in higher levels of achievement.

Principle 3: *Promote higher order thinking skills and communication skills*
Online pedagogy should include learning strategies that encourage demonstration of higher order thinking skills and communication skills.

Principle 4: *Teamwork and cooperation among students must be encouraged*
Online pedagogy must encourage collaboration and social interaction among students. This enhances their involvement in learning.

Principle 5: *Encourage active learning*
Teachers must incorporate authentic, problem-solving activities that augment student efforts to actively construct meaningful knowledge through interactivity and application in real-life situations.

Principle 6: *Encourage development of self-directed learning*
Online pedagogy should offer meaningful opportunities to students to bridge the knowledge gap by motivating and instilling responsibility in them. Resultantly, students will embark on significant self-directed learning.

Principle 7: *Opportunities for online summative and formative assessment must be provided*
Online courses should build in valid and reliable assessment periodically. This will provide learners timely feedback and ample opportunities to reflect on their progress.

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Principle 8: ***Mechanisms for providing prompt feedback must be built into the course***
Students need appropriate, timely and specific feedback on their performance. Online pedagogy must provide opportunities for students to reflect on what they have learned, what they still need to know, and how to assess themselves.

Principle 9: ***Effective time management and timely task completion must be emphasized***
Learning to use one's time well is critical for students, more so in an online environment as there is no substitute for time on task. Due emphasis should be given to defining time expectations for students in order to establish the basis for high performance.

Principle 10: ***All stakeholders must communicate high expectations from students***
In an online setting, it is pertinent to set clear expectations for quality student performance. Clear and high expectations provide students with precise guidelines about the type and quality of work essential for proficient and timely assignment completion.

Principle 11: ***Respect diverse talents and ways of learning***
Students have a wide variety of learning styles and needs. Online pedagogy should carefully consider prior knowledge, cognitive processing, personality styles, beliefs about learning, and demographics.

Principle 12: ***There must be a robust mechanism for monitoring development and mentoring***
Online pedagogy must support continuous monitoring and mentoring so as to facilitate achievement of intended outcomes of online learning.

(Modified from Saiyad et al[1] with permission)

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Teacher roles, competencies and skills required for online teaching

Good online teaching practices will also require faculty to develop competencies in three major areas: technology, subject expertise, and pedagogy. Technical support to develop and manage online teaching modules, time, and support to online teaching are other minor issues.

Table 5 below lists some of the expectations from teachers by students when going through online courses:

Table 5: Students' expectations during online courses

- Easy to follow course design and navigation
- Clear directions for activities and assessments
- Reasonably quick grading and feedback
- Regular communication from the instructors

Based on these needs, teachers need to perform the following roles and develop the required competencies to be effective at online teaching (Table 6):

Table 6: Teacher roles and competencies needed for online teaching

A: Roles:

- instructional designer
- content facilitator
- technologist
- process facilitator
- advisor or counselor
- assessor
- manager or administrator
- researcher

Goodyear et al[22]

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B: Competencies

To perform the above roles, the following **competencies** will be required:

- Knowledge of the online process
- Technical skills
- Online communication skills
- Content expertise, and
- Personal attributes: inherent motivation, integrity, visible, responsive and approachable, organized, analytical, respectful, active, flexible, open, honest, compassionate and supportive, and ability to lead by example.

(*Salmon*[23]; *Keengwe et al*[24]).

Skills needed for online teaching

The teaching skills required in the context of online teaching include[25]:

a. ***Communication skills:*** The need for clear and concise instruction is important for online teaching. Teachers who are adept at face to face teaching may need to augment their communication skills to be good online teachers.
b. ***Technological skills:*** Skills specific to the medium and content being taught, general computer literacy to be able to use word processors, spread sheets and presentations are pre-requisites for online teaching. For using simulations, additional skills may be required.
c. ***Pedagogical skills*****:** Online is only a medium for academic exchange - it requires a full complement of teaching skills, including generating learning objectives, matching content and mode to objectives, promoting interactivity, assessment and feedback, classroom management, and mentoring. A particular mention must be made of the skills of the teacher to engage the students who are physically separated from the teacher as well from peers and to encourage them to apply what they are being taught.
d. ***Design skills*****:** These include understanding and applying instructional design principles using learning materials in different formats. Teachers need to use student feedback to make changes in the format as well as ensure quality of learning.
e. ***Managerial skills*****:** Managing the classroom is as important in online teaching as it is in f2f situation. Ability to manage time, demonstrating leadership, managerial and mentoring skills, handling assignments and record keeping and following institutional, legal, ethical and professional requirements are some examples of these skills.[13]

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Technology for online teaching

There have been rapid advances in technology used to deliver educational content, and now even social media platforms have started exploring educational needs. Moore's law,[26] which is often extrapolated to state that technology advances which almost doubles every eighteen months, suggests that training people in use of one technology will have limited effect. Further, with advances in technology, teaching methods are also expected to evolve (Table 7).

Table 7: Types of technology available in online courses

- **Websites and blogs** – access to stored information and repositories; electronic versions of scientific papers
- **Multimedia technology** – appropriate combination of video / still images and sound
- **Asynchronous modes** – like threaded discussions, assignments
- **Interactive resources** – providing real time interaction between teachers and students

Compatibility, accessibility, ease of use, user-friendly, opportunities for feedback are some of the criteria directing the choice and adoption of online platforms. While selecting a technological resource, the following points become important:

- Technology needs to be chosen depending on user needs, and not simply because it exists. Technology needs to be aligned to the learning objective.
- Technology has to be user-friendly to all stakeholders. This includes elements such as easy installation of software on computers, requirement of basic programming skills etc.
- Technology needs to be accessible and amenable to use in a variety of platforms, such as desktop computers, laptops, tablets and even smart phones.
- Technology needs to be compatible with the level of learners in terms of language and ease of learning to make it effective.
- Consideration of costs always determine feasibility of use of technology.

It is often useful to use a mix of appropriate technological resources which are available. This enables one to cater to online learners with a diverse variety of learning styles. This in turn helps students achieve desired learning outcomes.[27]

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Pre-requisites to begin online teaching

To initiate online teaching, preparations will be required at all levels of stakeholders (teacher, learner, institution etc.). An important point is to ensure that all students have equal access to technology. So availability of enough computers and access to a high-speed internet connection on campus for all faculty and learners is an essential investment. The checklist to identify the pre-requisites in terms of infrastructure and support system that is required is given below (Table 8):

Table 8: Checklist to identify pre-requisites for initiating online teaching

1. Besides generalized IT support, does the institution have a separate cell to provide technical support to online learning activities?
2. Has a Committee been formed to coordinate and monitor online teaching in the institute?
3. What learning management system and software packages has the institute installed?
4. Is high speed internet freely available on campus?
5. Do all faculty and learners have access to laptops and/or smart phones?
6. Do all faculty and learners have individual and unique log-in IDs and passwords to access the learning management system?

(Modified from Brenton[28])

7

A Coordination Committee formed for each phase of MBBS teaching and headed by the MEU will be useful to monitor the quality of online teaching. Further, it may be useful to decide the workload and number of online sessions given to students each week, at the inter-departmental level. It is important not to subject them to cognitive overload as the attention span of students in online sessions can be pretty short.

Tools for online teaching

- **Online collaboration tools**: These enable the teacher and learner to upload and access lessons and assignments online. Texts, documents, images and videos can be shared, viewed and also edited in real time. Tools included in Google Apps and Google Classroom are a wonderful medium to brainstorm and simultaneously document the work of both the instructor and learner. Other tools available for online learning are Google Meet, Zoom, Cisco Webex, Free conference call, Microsoft teams, Go to meeting etc.

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- **Presentation software:** Widely used tools such as Microsoft PowerPoint and Google Slides are an excellent means to augment lecture content by embedding high resolution images, diagrams, animation, audio and video files.
- **Course management platforms:** This is also known as Learning Management Systems (LMS). These platforms allow stakeholders to organize all resources needed for a class in terms of the syllabus, document sharing, audio and video files, assignment announcement and submission, discussion boards, online quizzes, grading tools, etc. Canvas is one such example. Some of the widely known online learning management tools are Swayam, Moodle, Google Classroom, Coursera, Clinical Key, Udemy, Teachable among many others.
- **Audience response systems:** These are easy and quick ways to connect with learners and gauge their learning in order to adjust the pace of teaching to learner requirement. This was usually done through clickers in a traditional classroom. A more popular option now is with use of software and applications which enable one to embed interactive polls between presentations, and gather responses through smart phones, which can be displayed in real-time to learners.
- **Lecture-capture tools:** Instructors are able to record their lectures on their local devices without additional requirements and upload them for learners. Such tools are useful for their ability to provide the learner with opportunities to review the content at their own time, pace and frequency. Studies have shown that such tools only augment the teaching-learning process rather than diminish student attendance.

Best practices in selecting appropriate technology

Radical changes in application of technology are already reshaping all areas of teaching and learning.[29]. Traditional forms are being challenged and massive online open courses (MOOCs) are paving their way in. Nevertheless, a visible disconnect exists between technologies, research, design and practice.[30]

Quite often, you will find instructors using fancy technology simply because it exists. There might be no need to use complex technology where a simple discussion or a simple reading might suffice. Technology is generally effective when the application directly supports the objectives and the purpose of the curriculum. Multimedia which simulates real-life situations will always be preferred, and it is best if they are tailored to the local context.

Here is a list of do's and don'ts that can help one use technology in an optimal manner (Table 9):

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Table 9: Some do's and don'ts when using technology in online teaching	
Do's	**Don'ts**
Choose and integrate appropriate technology that supports overall educational goals and curricular objectives.	Avoid using technology for the sake of using it, if it doesn't support the lesson plan. It is a costly mistake which must be avoided.
Train and encourage teachers to make judicious use of technology in their classrooms.	The role of technology should be to empower teachers and learners rather than to replace them.
Technology should be adjustable in terms of students' skills and abilities, provide feedback on progress, and give them enough opportunities to collaborate in the teaching-learning process.	Instructors should not be over-dependent on technology. No technology is foolproof, and technology depends on multiple external factors.
Ensure that teachers and learners are actively involved with a range of relevant and practical engagement techniques. Such strategies should become standard practice.	Mere use of technology doesn't necessarily guarantee engagement. Student engagement strategies will need to be built in while designing a lesson plan.
An optimal level of fidelity (realism) is preferred when using simulations. The degree to which technology simulates the intended task or environment must preferably match with the learner's expertise and the educational objectives of the module.	Every technology requires a minimum level of infrastructure, in terms of hardware and software tools or internet accessibility. Students with limited access to these technologies must also be considered during planning. Fair and equal access to all students is a pre-requisite for use of technology.

Implementing Online Teaching

Once the basic infrastructural requirements are in place, online learning can be implemented at institutions for individual batches. Preparation for online teaching at the level of the individual class can be divided into the following phases:

(a) Lesson planning
(b) Conducting online sessions
- Keeping students engaged
- Facilitating online discussions
- Managing Online classroom

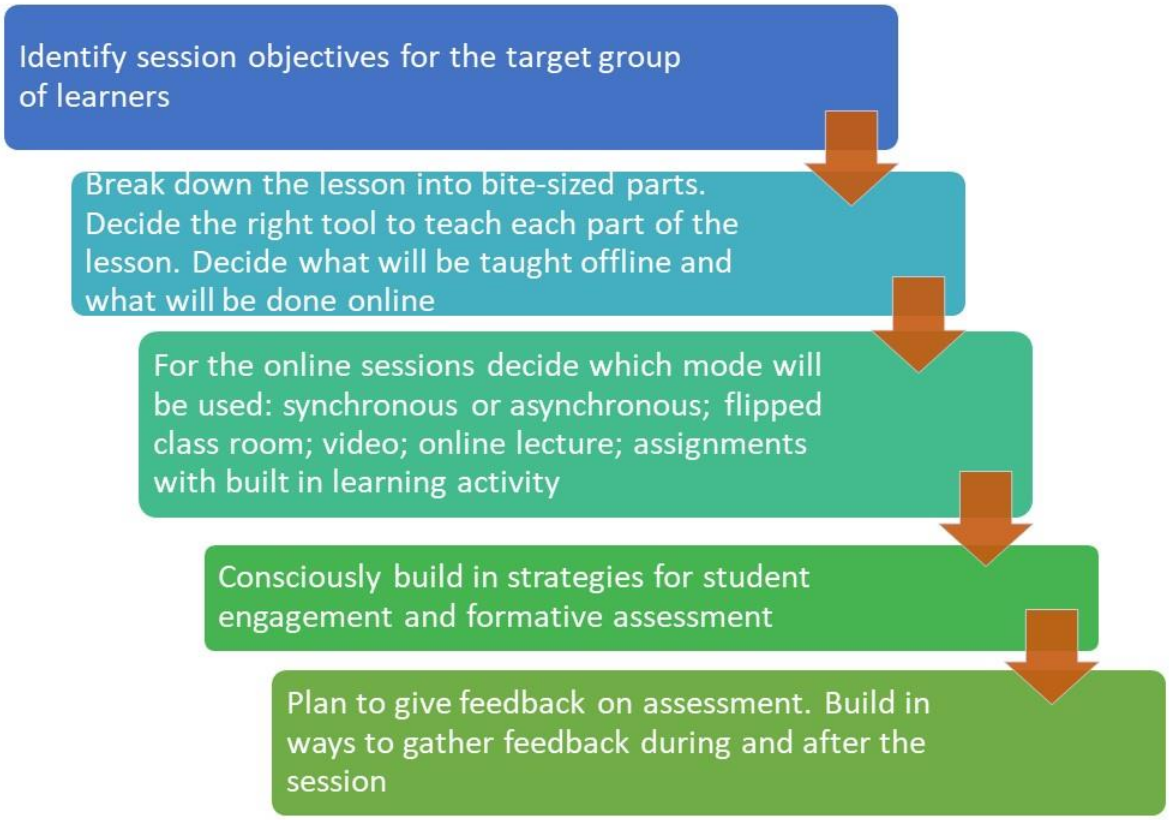
(c) Post-session assessment and evaluation

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A. LESSON PLANNING FOR ONLINE TEACHING

A well-designed lesson plan is key to the conduct of an effective online teaching session. Similar to any other teaching plan, if one identifies and aligns the 'golden triangle' of learning objectives, teaching-learning methods and assessment, the subsequent conduct of online teaching session will be a smooth affair. The following flow chart (Fig. 2) will help in preparing a lesson plan before actual conduct of online teaching session.

Fig. 2: Lesson planning for online teaching session



It is important to break the lesson into small bite-sized parts. It is important to be prepared with Plan B in case of technology glitches. Never feel embarrassed to accept the failure of technology system and be ready to plan the session on another day or with some other mode. Not everything needs to be delivered in the synchronous online mode. It is important to explore ways other than online lectures. It is best to use a mix of suitable methods to deliver content and make the content more relevant and interesting.

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Table 10 lists some of the asynchronous methods to teach students online.

Table 10: Examples of asynchronous online teaching methods
• Send reading material and ask them to take a self-assessment • Assign video to watch and ask to submit related assessment • Ask learners to teach the class or conduct quiz • Share resources and ask learners to submit a project • Send learners on an online scavenger hunt: Ask them to search for credible literature on a specific topic • Give paper case and have a discussion online • Have a debate • Start a wiki • Give an experiential activity and ask learners to write reflections

The **flipped classroom** concept uses valuable synchronous time to clarify concepts, clear doubts and discuss the more in-depth issues of the topic, after the learners have learnt the basics on their own.

CONDUCTING ONLINE SESSIONS

Keeping students engaged

Keeping learners engaged is the most challenging part of online teaching as there is no face to face contact.

Table 11 lists some of the tips and strategies to keep learners engaged during the actual session.

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Table 11: Tips and strategies to keep learners engaged
• Try and learn learners' names and use them • Build a rapport with learners: use formal and informal ways of interaction, model disclosure • Create the right environment for the class; build trust • Be available to answer questions and solve doubts • Introduce interactivity through online tools which enable conduct of polls, and gather real-time response • Embed multiple choice questions or quizzes between the session to gauge learning understanding • Ask how and why questions to challenge learners like you would be in a traditional classroom • Give opportunities for learners to ask questions and clarify their doubts • Check if the pace of the lesson is fine with the class • Use break-out rooms and give group work • Encourage discussions online

Questioning is one of the simplest ways of engaging with students. The art of questioning has to be learnt for use both in online and offline modes. Broadly, these questions are not meant to be graded, but used only as a tool to generate attention, promote thinking, link knowledge and promote application. Some of the types of questions used for this purpose (Table 12) are as follows:[31]

Table 12: Type of questions that can be used for student engagement	
Format of question	**Example**
Rhetorical question	Have you seen blood pressure being recorded? Let me show you.
Questions which generate interest	What would happen if you don't eat carbohydrates for 3 days?
Questions to ascertain baseline knowledge	Can someone tell the route of administration of BCG vaccine?
Questions to help the class recall already learnt facts	What is the daily protein requirement for a normal adult male?
Redirecting questions	We learnt of some drugs which can decrease blood sugar level. Can you tell me some drugs which will increase blood sugar?
Bridge questions' (i.e. questions which bridge the gap between knowledge and its application)	How can the clinical differences in diarrhea originating from small intestine and large intestine help you to decide on the need for antibiotics in a child with diarrhea?

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Facilitating good online discussions

Online discussions have high pedagogical value as they promote interactivity, engage students and build in social presence. Gao et al[32] have suggested that online discussions should aim at promoting higher order thinking. This can be done by questioning, elaborating, interpreting and relating information to prior knowledge. Discussions should help students to construct their own knowledge. Presenting and discussing conflicting perspectives (e.g. role of statins in cutting down risk of myocardial infarction, differing views on ethics) helps in generation of knowledge which is long lasting.

At first, it may appear difficult but most of the nuances of good face-to-face discussions can be applied online as well. Some of the techniques of good facilitation are as follows:[33]

a. Involving all students in discussions is important. If the groups are very large, it makes sense to divide them into manageable sub-groups with facilitators in each group. In case enough faculty are not available, residents can be trained in facilitation skills.
b. Teachers should make an effort to identify non-responders and encourage them to contribute. Similarly, one should not allow a few students to dominate the discussion.
c. All contributions must be acknowledged. This opportunity should be utilized to provide feedback to students.
d. A good facilitator knows when to speak and when to go silent. While the facilitator may have to take the lead in the beginning, a good discussion means that students interact with each other with the facilitator taking a back seat.
e. Students tend to be callous and abrasive with each other in online settings. This might lead to friction and others might not participate enthusiastically. Therefore, it is important to set ground rules in the beginning and intervene when any untoward incident occurs
f. Allow students to lead the discussion after they get used to the format. This helps them to develop ownership of the process and brings out new ideas, new way of looking at existing situations, and a much-needed change from monotony.

Online classroom management

One of the key differences between conventional and online classes is classroom management. In a conventional classroom, the teacher can ‘see’ all students, notice their body language, ask/answer questions from specific students and move around in the class. In online classes, however, this functionality is limited. Several software packages allow conversion of a large class into smaller groups (breakaway or

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method is to manage the group as a whole. Just like conventional classes, it may be good idea to keep the class size small. Students generally remain ‘anonymous’, especially when the online class size is large. This usually helps otherwise shy students to ask doubts using the chat box function.

Another important difference lies in the learning environment. While mobile devices are generally discouraged in conventional classes, they play an important role in online classes. As both teachers and students are getting used to the new behavioural norms, it may take some time to adjust when f2f classes start again.

A concern voiced by many teachers is the ‘disappearance’ of students after logging in. While asking all students to keep “*camera on-mike muted*” might be one option, online assessment provides an important tool to ensure presence. The online teacher lacks the opportunity to see the expressions of her students to gauge their understanding. This is where role of ongoing assessment comes in. This will be discussed more under the assessment section.

Table 13 lists some online classroom management techniques:

Table 13: Online classroom management techniques

1. Lay down ground rules for the classroom
2. Encourage students to develop their own ground rules
3. Emphasize interaction. Try to identify non-responders
4. Use breakaway groups to encourage interaction
5. Be a roving facilitator when using breakaway groups
6. Avoid information overload
7. Pose probing and application-oriented questions
8. Provide immediate feedback
9. Use techniques like flipped classroom to promote active learning
10. Don’t read from your slides
11. Link attendance to participation in class
12. Use more than one technology to promote interaction.

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B. POST-SESSION ASSESSMENT AND EVALUATION

Wherever possible, plan to conduct online summative assessment after an online teaching session. It does not stand to reason that the learners trained through one type of learning environment are assessed through a different one. Where online assessment is not possible, traditional methods of assessment can be used.

Some simple informal classroom assessment techniques such as polls, muddiest point or one-minute paper can help in knowing whether the concepts just taught have been understood by students or not. For formal assessment, MCQ tests can be carried out using Google Forms or other interactive tools.

Evaluation must be carried out as part of quality assurance practices. Evaluation of both the learning process and outcomes must form a part of any online teaching program. Student feedback can help in improving the manner of delivery of this content. More on this topic can be read in the section on Quality Assurance of online learning.

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Teaching Procedural Skills Online

Teaching procedural skills online is a formidable challenge to medical educators. E-learning has been shown to be effective in supporting skills teaching. Fitts and Posner's[34] three-stage theory of motor skill acquisition is a popular method used in teaching surgical and motor skills. These three stages of acquisition of a skill are:

(a) **Cognition** or understanding the task: This needs explanations about the activity.

(b) **Integration** or comprehension and performing the mechanics of the task: This needs provision of feedback and deliberate practice.

(c) **Automation** or ability to perform a task with efficiency, speed and precision: This needs little cognitive input but automated performance. The focus is on refining performance.[35]

While the stage of cognition can be fostered by online interactive sessions, the stages of integration and automation require specific planning. Complex procedural skills can be taught by breaking them down into small steps. Peyton[36] suggested a four-step approach to introduce skills to new trainees as follows:

Step 1: Demonstrate: The instructor shows the skill at a normal pace. No additional comments are offered at this step.

Step 2: Talk the trainee through: The instructor describes each sub-step of the procedure while showing the skill again to the students.

Step 3: Trainee talks trainer through: Here the trainee describes the steps while the instructor performs the skill for the third time, based on the trainee's description.

Step 4: Trainee does: The trainee performs the skill on his or her own.

These steps break the task into four components: demonstration, deconstruction, formulation and performance.

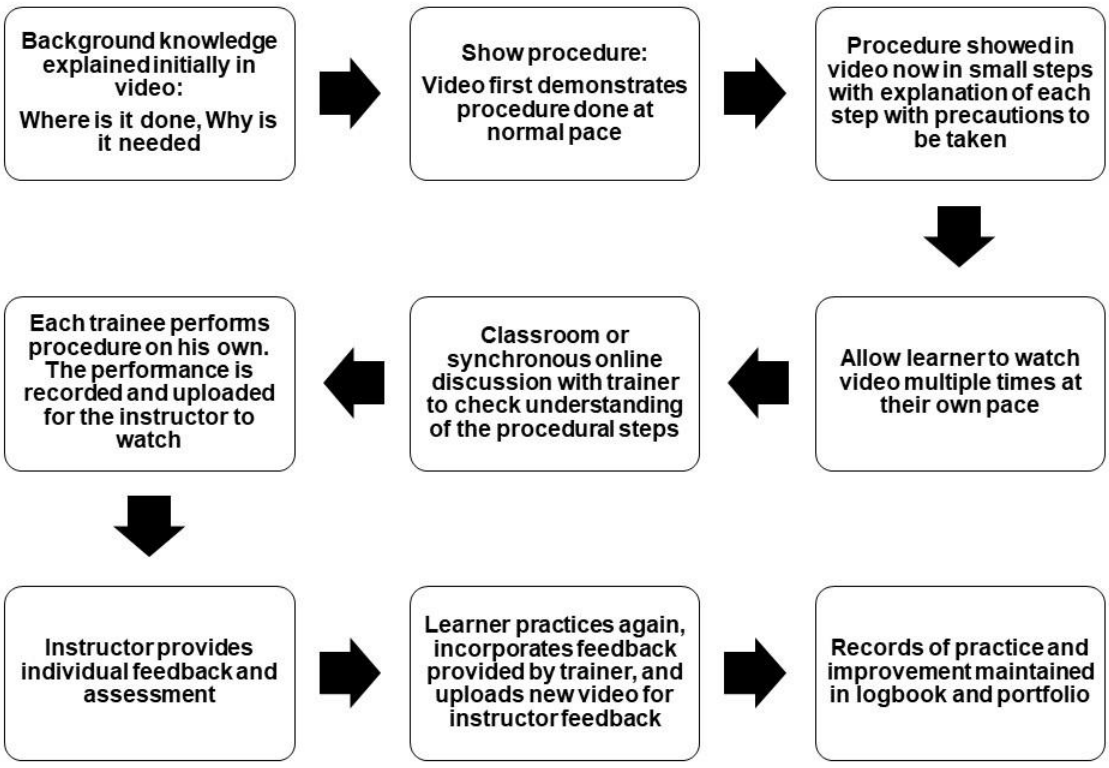
Online instructional videos provide learners an opportunity to watch the demonstration and to deconstruct different steps of the skill at the trainee's pace. These videos have the flexibility of being paused and being watched repeatedly at multiple occasions. This is said to help learners understand complex procedures better. This process helps in acquisition and retention of the procedural knowledge.[37] Further, if used in a blended manner, this can be combined with actual performance. The performance phase can be recorded and can be used to provide formative feedback. These vide

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supervision, post-procedure debriefing, providing feedback, assessment and promoting reflection.[37]

Alternatively, these videos can be watched in small groups / online break rooms with discussion.

Fig.3: Suggested training model of how online videos can be used to teach skills



For example, a simple procedural skill such as tying a knot, or suturing needs task-training models. An instructional video can take the trainee through the steps of demonstration and deconstruction. The comprehension step ("trainee talks the trainer through") can be done by using synchronous interactive online sessions with the trainer. The next step of performance ("trainee does") can be recorded. Simple recording devices such as a laptop, smart phone or headgear camera can be used for supervision and recording. The recorded video can be uploaded to obtain feedback and for assessment. The learner can repeat the performance based on the received feedback, and again video

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until he attains the pre-defined level of competence. Feedback provided on these videos have been shown to improve simulation scores, technical skills and even patient safety.[38]

Availability of task training models or kits for all the procedural skills could be a challenge. The learning resource material needs to be developed or acquired depending on the availability, resources and requirements. If common training kits can be made available for all the learners by the institution, it ensures uniformity. For more complex procedural skills, availability of mannequins and online screen-based virtual-reality simulators will be valuable for training, feedback and assessment.

It is possible to prepare peer-reviewed educational videos to teach skills and procedures.[39] People learn effectively from multimedia.[40] Learners have been found to use online videos prepared for conducting OSCEs for self-study of clinical skills.[41]

Teaching health humanities online

Competencies that focus on imbibing appropriate values, ethical conduct, professionalism, interpersonal and communication skills are an important component of the MBBS program. These skills were previously deemed to be obtained passively by observing and associating with senior colleagues in the profession. However now, with the introduction of modules like AETCOM[42], the acquisition of these competencies has been mainstreamed. Many of these outcomes lend themselves to online acquisition with correct lesson planning and appropriate use of technology.

It must be remembered that learning needs should drive the use of any technology and not vice versa. Many of the learning outcomes can be attained by fairly low investment in technology and use of free and open-access resources. We have chosen examples from the AETCOM module[42] to demonstrate how the online learning environment may be used and adapted to help learners acquire requisite competencies.

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Example 1. This example uses a first-year communication module that encompasses large group and small group learning, observation skills, collaborative and self-directed learning and formative assessment. This example uses Module 1.4 of the AETCOM booklet[42].

S. No.	Component	Online adaptation	Resources
1.1	Introductory session	Online lecture to large group OR Uploaded recorded lecture with online discussion (flipped classroom format)	Online video platform (subscription or open source) Above + Online repository such as YouTube
1.2	Self-directed learning	Provide assignments that require students to: - research and compile information individually and in groups - prepare and upload reports These reports are then reviewed by faculty and shared with students	Group email OR Online word processing platforms that allow documents to be shared or edited together ± Online video platform that allows group calls
1.3	Small group sessions on improving communication skills	A communication video with common mistakes in communication is prepared with standardized patients This is viewed together by learners A discussion (live or chat box), that elicits student observations of these mistakes and how to correct them, follows	Online video platform (subscription or open source)
1.4	Closure session	A discussion in small groups that summarizes learning and future learning to be done	Online video platform
1.5	Assessment	Students are graded for - Participation in activity and - assessment of self-directed learning	Spreadsheet or an electronic form with components

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Example 2. The second example adds the complexity of a skill session. This example uses Module 3.1 of the AETCOM booklet[42].

S.No.	Component	Online adaptation	Resources
2.1	Introductory session	Same as in example 1.1	Same as in example 1
2.2	Small group sessions	Same as in example 1.3	
2.3	Skills lab sessions	A standardized patient is available online for real-time communication. A communication task is provided to the student which is done online. (Ideally the session is recorded and uploaded to the server for retrieval by the student designated peer and preceptor) The standardized patient assesses learners using a check list and comment form and submits it online. He can also be available for the debrief. After the task is completed, the student retrieves the recording of the encounter and records observation, comments and points for improvement The preceptor can view the interaction live OR can retrieve the recorded encounter and review. A debrief opportunity is created between the student and the preceptor where the performance is reviewed and a plan for improvement is made through guided reflection.	Online video platform (subscription or open source) with recording facility (ideal) and ability to retrieve and view (ideal) Online form to collect patient-preceptor and learner impressions of encounter

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Example 3: This example describes a way to emulate a team tag-along session. This example uses Module 2.4 of the AETCOM booklet[42].

S.No.	Component	Online adaptation	Resources
3.1	Tag-along session	An identified member of the health care team joins on a video call with the group of students and facilitator. After an initial goal-setting discussion, the member of the health care team does a walkthrough of his or her area talking and taking questions from the students. A front facing camera fixed to the upper garment and earphones are simple and cost-effective workarounds (as opposed to having another person accompanying the team member with a camera). It is important to brief patients and colleagues involved in this session and get necessary permissions for use of videos and images.	Online video platform (subscription or open source) Smart phone to transmit the walk - through to the online platform
3.2	Small group discussion	Can be done immediately following the walk through or later to elicit observations, reflections, summaries and learning	Online video platform (subscription or open source)

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Example 4: This example provides a way to emulate a session on empathy. This example uses Module 2.8 of the AETCOM booklet[42].

S.No.	Component	Online Adaptation	Resources
4.1	Patient interviews	With suitable and appropriate permissions students may be allowed to interview family members of patients through an online platform. (If needed, faculty observer can be present to ensure comfort and safety). Logins from different locations of family members allows exploration of feelings of relatives - not proximate to the patient.	Online video platform (subscription or open source)
4.2	Large group discussion	After suitable permissions have been taken, family members are asked to join, speak and answer questions from participants in a large group discussion on a moderated online platform.	Online video platform (subscription or open source)
4.3	Self-directed learning	Lists of online resources such as videos or movies are provided. Students can view them offline - write a report and submit them.	Ability to submit through email or an online submission process
4.4	Closure	Same as in 1.4	
4.5	Formative assessment	Submission of items in 4.3	

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Example 5: This example provides an example for emulating an online-case based discussion on medical ethics. This example uses Module 3.2 of the AETCOM booklet[42].

S.No.	Component	Online Adaptation	Resources
5.1	Introduction of the case	A paper case may be posted ahead of time and introduced through a small group online session. Innovation could include a video recording of a patient interview followed by discussion.	Online video platform (subscription or open source)
5.2	Self-directed learning	Same as in 1.2 based on the case provided	
5.3	Anchoring lecture	Same as in 1.1	
5.4	Discussion and closure of case	Same as in 1.4 Additionally, an online role play can be done with two students. Remaining students can identify issues and critique them.	Online video platform (subscription or open source)

From these examples, it may be evident that a good approximation of learning which occurs in a physical environment, can be emulated in an online environment. This requires adequate planning and use of resources even if limited creatively. It must be emphasized that, remote learning is not a substitute to proximal guided learning that a master teacher provides. The use of webcams and phone cams reduce the amount of detail that can be captured in an online system and do not completely replace the aesthetics and immersive experience of a skills lab or patient care setting. However, planning, practice and wise use of technology allows skill acquisition to proceed in an uninterrupted fashion.

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Online assessment

Online assessment involves the use of electronic or digital devices to construct or deliver assessment tasks. This may also be used to monitor progress of learners, to mark or grade assessments, and for record keeping of these data. The digital devices can range from simple devices such as smart phones or tablets, to laptops and desktop computers, and can go up to complex simulators and gaming devices.

Role of assessment in online teaching

Assessment can be used in different ways in online teaching. Some of them are as follows:

1. ***Assessment before teaching***: Using short quizzes or tests before starting a topic can be useful for teachers to gauge the baseline knowledge and skills of the students. This can be used to subsequently tailor the teaching according to the level of the learners. This can even be done informally by asking questions before the session starts using the poll option or chat box. Teachers need to know the level of the group as a whole and not individual performance in this situation.

2. ***Assessment during teaching***: This can be done at the level of a course or at the level of a teaching session.

    a. Tests conducted midway between a course help students to self-assess their learning and keep up with the deadlines. They help teachers to make mid-course corrections and give feedback to learners.

    b. It is always a good idea to break up long teaching sessions into smaller sections. This helps students to concentrate. Several simple classroom assessment techniques[42] exist and these are useful as these are quick, anonymous, and non-graded. Techniques such as polls, muddiest point or one-minute paper can help in assessing knowledge, recall, and understanding. Several of these techniques can be adapted to online settings with use of interactive applications. Here key messages from the topic just taught can be asked in an applied form. This helps teachers in knowing whether the concepts just taught have been assimilated by students or not. Again, here group performance will be important rather than individual performance. If most of the students have got the answers wrong, the concept will have to be revisited and explained. Concept maps and one sentence papers can be used to test ability to synthesize

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Breaks such as these, also give students a chance to ask for clarifications, which they otherwise hesitate to ask.

3. ***Assessment after teaching***: This can be done at the level of a unit or at the level of a course:

    a. After completion of a unit (or some units), formative assessment can be done. Here the purpose will be to assess the performance of the learners, as well as to give feedback about what they have done well and what can be improved.
    b. After the completion of a course, summative assessment is performed to make pass/fail decisions for certification.

4. ***Assessment as learning***: It is customary to classify assessment as formative (assessment *for* learning) and summative (assessment *of* learning). The contemporary trend is to use assessment to facilitate learning. This involves giving students an assessment task which will require them to go through an authentic experience or perform an activity, and thereafter submit a report. For example, students could be asked to go into the community or a hospital ward, interact with certain subjects, read about the topic, and compile their findings and submit their learning in the form of a report. This kind of assessment erases the artificial divide between learning and assessment. This also promotes self-directed learning.

Formats for e-assessment

When online assessments first started, they merely involved transfer of paper-based questions to an online format. However, much of that has now changed. With e-assessment, a whole range of different question formats are possible.

These include multiple choice questions and their variations such as extended matching or assertion-reason type questions. But besides these, there is the possibility of using audiovisual triggers such as clinical photographs, X-rays, gross or microscopic images, graphs, or auscultation sounds. Simulations can be used to develop electronic patient management problems and virtual patient scenarios.

Live interactivity is possible in online assessment which makes it possible to perform virtual OSCE, where students can be assessed using standardized patients or videos. This is useful for assessment of communication skills and history taking skills.

Electronic portfolios can be used to gather evidence of learning. Activity based assessment such as project-based assessment or reflective writing are useful methods

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which can assess behavioural competencies which are usually considered ‘immeasurable’.

The different question formats that can be used in online assessment are summarized in Table 14.[44-45]

Table 14: Different question formats that can be used in online assessment

- Multiple choice questions and its variants
- Short answer questions
- Online polls
- Picture based questions based on audiovisual clues
- Electronic Patient Management Problems
- Objective structured video examination (OSVE)
- Projects
- Reflections
- Portfolios

Advantages of automation

Use of well-designed online assessment formats brings in efficiency and ease in marking assignments. Several assessment formats can be automated during their construction phase, reducing subsequent faculty workload. Use of well-constructed rubrics and standard marking formats can make most assessment formats more reliable and fair to learners, by reducing inter-rater variability. It is possible to verify whether students are adhering to deadlines and submitting assessments on time. Monitoring learner progress is simplified as record keeping is much more meticulous and at one’s fingertips.

Rethinking the concept of what to ask

Since online assessment first began by replicating paper-based assessment to computer-based settings, most people presume that it can be used only to test objective assessment questions. However, this is not true. The way students learn, depends heavily on what kind of mental processes are activated by the questions asked during assessment. If questions merely test rote learning, students will veer towards surface learning. When questions asked are more complex, students will start learning deeply and try to connect the dots between different mechanisms. The kind of trigger that we use to ask questions influences the learner’s way of studying differently. This can be done by the following ways (Table 15):

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Table 15: How to ask questions differently

What to ask	How to do this and what this does	Example
Ask higher order questions	Rather than asking questions from the lower levels of Bloom's Taxonomy which encourage rote learning, ask questions from the higher levels such as comprehension, application, analysis, synthesis and evaluation. These could be in the form of problem-solving exercises, projects, surveys, or case studies.	Instead of asking: *Enumerate the morphological changes seen in the heart in rheumatic heart disease.* convert it into a higher-order question by simply using a clinical scenario. *If a child with rheumatic fever is not treated, what are the changes that can be expected to be seen in the heart 15 years later?*
Ask integrated questions	Ask questions based on pathophysiology and mechanisms in clinical subjects. Similarly, when teaching basic subjects, the applied relevance must be emphasized. This will help students to form neural connections in their mind and study a subject deeply by understanding the basics rather than merely memorizing it by rote.	Instead of asking: *'What is the action of cyclooxygenase on inflammation?'* the student can be given a scenario like, '*After watching too many webinars, a student has a headache and takes an aspirin to relieve the pain. Which steps of inflammation will be affected by the medication*?'

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Build authenticity into questions	When students will finally encounter patients, they are likely to face complex situations. So instead of restricting questions to one chapter or topic, it may be useful to expose them to scenarios where they need to explore their learning beyond unit-wise or department-wise boundaries. Authentic scenarios will help in preparing students for real life patients.	If a question about a treatment of a condition is asked, it may be possible to include details about a co-morbid condition, which could lead to side effects or contradiction to use of a routine drug. If a patient is poor, and a drug cannot be afforded, then that kind of situation can be built into the question. If a patient might not be expected to comply with a regimen, then what choices would a physician have to alter his management?

Assessment in clinical settings

When it comes to assessing clinical competencies, cognitive parts of competencies such as clinical reasoning and communication skills can be assessed online. It is also possible to test heart sounds or visual signs through online platforms. Simple electronic patient management problems or complex AI technology-based virtual patients (computer-based simulations) can be used to test clinical reasoning skills.[46-48]

There have been reports where Objective Structured Video Examinations (OSVE) have been used with some evidence of being valid.[49] In an OSVE, different clinical scenarios were chosen depending upon the clinical and communication skill competencies to be tested. Short patient-clinician interactions, less than 10 minutes long, were scripted and filmed. Each scenario included some deliberate communication skills elements such as greeting the patient, checking for the identity, use of open and closed questions, eye contact, displaying empathy, clearing doubts, summarizing and closing. Some obvious errors in communication were included in the script. Students were expected to watch the video. Thereafter, they were given answer sheets where they had to identify what was done right and what was done badly in the patient-doctor interaction.

However, Holmboe[50] stated that “although simulated patients and other simulation technologies were important and reliable tools for teaching clinical skills and evaluating competence, they cannot substitute direct observation of students’ clinical skills on real patients by the faculty”.

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Now, with the availability of software which permits real time interactivity such as Google Meet, Zoom or Skype, students can be observed and assessed on history taking or communication skills using real or standardized patients. These sessions can be recorded easily and assessed. Assessment of communication skills, professionalism and attitudes can be done through use of simulations, standardized patients and online *viva*. This has been discussed earlier. Use of hypothetical scenarios can help in assessing a student's competence in managing complex clinical situations.

With the availability of break-out rooms, several institutes are experimenting with conduct of online or electronic OSCEs. This, however, requires a great deal of coordination and planning so that students move in and out of online OSCE sessions seamlessly. Each room needs presence of cameras and recording equipment. Faculty and standardized patients are needed depending on the stations. Proctoring devices and encryption of data may be essential. This is an expensive affair, and needs involvement of a whole team of faculty, assistants and IT specialists to run smoothly.

Choosing the right assessment tools

The assessment clock model[51] provides educators practical guidance about how to determine the key characteristics of assessment and decide the most suitable assessment tool in a normal or crisis situation. This model is based on van der Vleuten's[52] empirical formula:

> *Utility of assessment = Validity x Reliability x Cost-effectiveness x Acceptability x Educational Impact*

The model can be interpreted to suggest that in normal circumstances, when one is developing a low-stakes examination, more weightage should be given to features like the cost, acceptability and educational impact. For high stakes examinations, validity and reliability are more important characteristics. However, in crisis situations like the Covid-19 pandemic, weightage would be on acceptability and cost issues, especially as we are transitioning to a new method of assessment, and there are issues of fairness and security.[53] Validity and reliability will remain the most important issues for high-stakes examinations like selection examinations and high-quality items must be chosen carefully for inclusion into question banks.

Feedback in online settings

Feedback is a two-way process. Students need to get feedback on how they are performing, while teachers need feedback from students on how their teaching is being received.

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When learners are provided with formative feedback, assessment becomes a learning opportunity. Online assessment enables provision of individualized feedback which plays a very important role in enhancing student learning. This can be done using several formats. In case of assessment-related feedback, examples and model answers provide excellent opportunity for the student to compare his performance. This can help one to reflect on the assessment process also.[54] Feedback can be built into assessment, using automation in certain cases. For example, in case of self-assessment modules to be administered at the end of every unit, specific feedback can be built into each option chosen by the learner. Automation easily enables this to be shown to the learner as soon as they have submitted their responses. Another way of providing feedback is to design automated feedback statements based on scores obtained by the learner. This might not be very specific but can provide some guidance to the learner. For faculty, common feedback responses can be designed in the form of macros which need to be inserted by ticking a box, enabling faster marking and provision of specific individualized feedback.

Feedback related to psychomotor skills can be given after viewing recorded videos as explained earlier. The logbook can also be maintained electronically with options for locking after each loop. This can also serve as a permanent record of the progress made by the learner.

If time permits some personal time devoted to each student can be very productive. However, personalized feedback requires lot of time and effort from teachers. To be available to students for voice interactions outside the scheduled sessions can be very helpful, but taxing for the teachers. It may be a good idea to provide fixed time slots for personalized interactions through virtual or telephonic modes.

Group feedback is another technique, where all assignments and feedback are available for all members to view and correct themselves. This also makes the whole process transparent.

One advantage of using online tools is that feedback can be given in the form of small doses which are spaced out throughout the course. Small doses of frequent formative feedback will be more easily accepted and assimilated by learners. Faculty will need to be trained in providing constructive feedback. Use of rubrics and macros can enable specific feedback to be delivered efficiently and at fixed periods, depending on the pace at which learners are progressing.

The issue of plagiarism

A common complaint among teachers is that students tend to copy and paste from online sources. Plagiarism is a universal phenomenon among learners. It will be important to spread awareness about what constitutes plagiarism and why it should be practiced

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among both students and faculty. Use of anti-plagiarism software should become a routine practice. A strict non-tolerance policy against plagiarism needs to be enforced and a culture of academic integrity needs to be slowly encouraged on all campuses.

The cost of online assessment

While there are several free or low-cost software and applications which permit one to conduct low-stakes examinations and classroom assessment easily, using online tools for high-stakes examinations comes at a high cost. However, as the number of users increase, the cost of these software applications is likely to come down.

Proctoring devices are required to eliminate the possibility of student cheating and manipulation. These need to be installed at the level of the Universities and institutions, to prevent copying. Electronic software is available which block the use of other screens when the examination is on. There are ways to monitor eye movement and time away from the camera. These tools can enable examinations to be carried out under surveillance of web cameras. This will incur massive costs and will require storage of huge amounts of electronic data.

It must be remembered that online assessment is not the ultimate solution to all our woes. It must be used in conjunction with face-to-face assessment. However, it does help in reducing faculty workload through automation. To be fully acceptable, we will have to seek tools which make assessment valid, reliable, cost-effective and acceptable.[55] Overall, one cannot ignore the educational impact of using assessment on student learning. Online assessment is now an integral part of the assessment toolbox. It is not a substitute, but a complement to regular face to face assessment.

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Quality assurance in online learning

As the use on online modes of teaching and learning increases, it becomes important to monitor the quality of educational processes and determine if the intended educational outcomes have been attained.

Several processes need to be evaluated for quality assurance in online learning.[56-57] These are listed below:

(a) Leadership and management: Policy, vision, mission, goals, planning
(b) Faculty profile and faculty development
(c) Availability of technology, infrastructure and learning resources
(d) Curriculum design
    i. Competencies, learning outcomes and learning objectives
    ii. Instructional methods
    iii. Course activities and learner engagement
    iv. Assessment
    v. Continuous quality improvement and evaluation
(e) Learner support and feedback: learner profile
(f) Learner accessibility and experience

Just as in the traditional classroom, some **benchmarks** are essential to the conduct of online teaching. These include[58]:

- clear planning,
- good infrastructure,
- faculty support to conduct online learning,
- clear standards for good course design,
- clear instructions for students,
- open communication channels between faculty and students,
- regular feedback to students on their progress,
- regular feedback from students on their experience, and
- continuous monitoring and evaluation.

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How to conduct blended learning sessions

It is predicted that online learning will continue to be a part of our regular teaching armamentarium even when the pandemic ends, albeit in a blended learning format. **Blended learning is the "thoughtful integration of classroom face-to-face learning experiences with online learning experiences**".[59] Given the experience of online learning that has been gained during the pandemic, it may be useful to continue using it in the post-pandemic phase, in a blended learning format, subject to further deliberations and consensus.

Blending the advantages of face-to-face interactions with online sessions enhances the learning process. Blended learning can:[60]

- Expand the opportunities available for learning,
- Provide information and resources for learners,
- Streamline course management activities,
- Facilitate student engagement through interactivity and group work.

Hallmarks of blended learning:

There are four hallmarks of blended learning (Fig.4). These are:

1. **Seamless integration of online and face-to-face session:**
   The facilitator integrates the face-to-face session with online activities by summarizing the online activity and linking it with the face-to-face session.

2. **Increased learner control over time and pace of learning:**
   Learners should be able to access the online contents at the time and place of their convenience. There should be flexibility in learning.

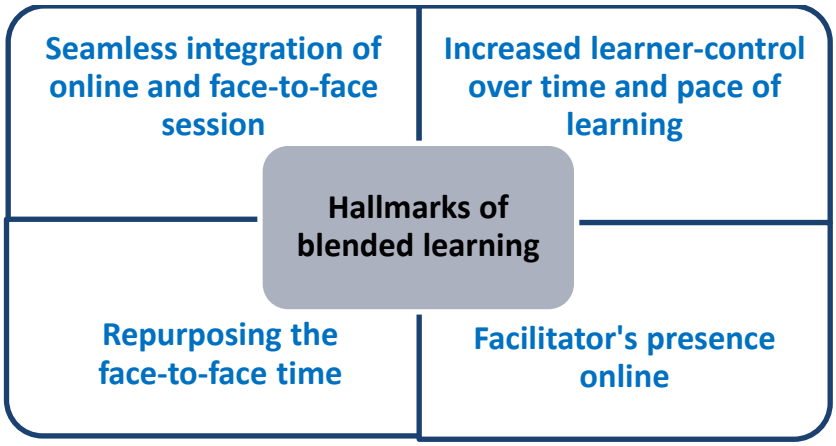
3. **Online presence of facilitators:**
   Facilitators should be visible through the online activities. This is possible by providing timely feedback and participation in discussions.

4. **Repurposing the face-to-face time:**
   Traditional class time is replaced with time taken by students to carry out their online learning activities. It is ideal to use the face-to-face learning time to impart higher-order learning and skills, while using the online sessions to recall or deliver basic knowledge and carry out collaborative activities. Blended learning provides

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possibilities to repurpose the contact time to facilitate deeper thinking and in-depth learning.

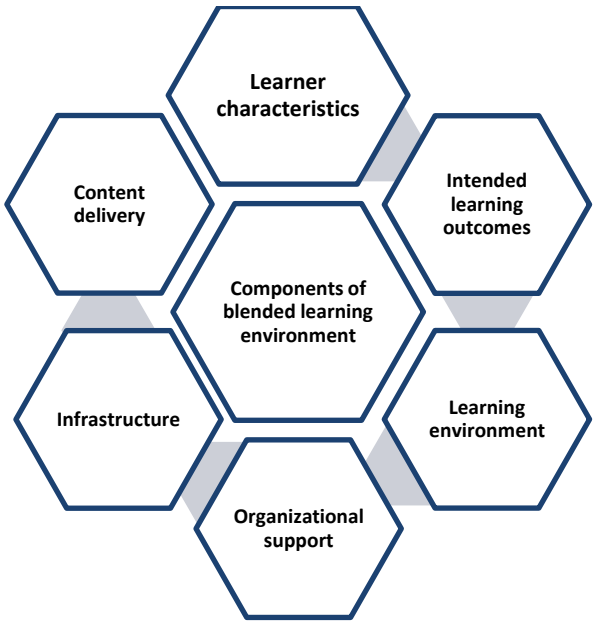
Fig. 4: Hallmarks of blended learning



Components of blended learning

Fig. 5 shows the main components which make up the blended learning environment.

Fig. 5: Main components of the blended learning environment

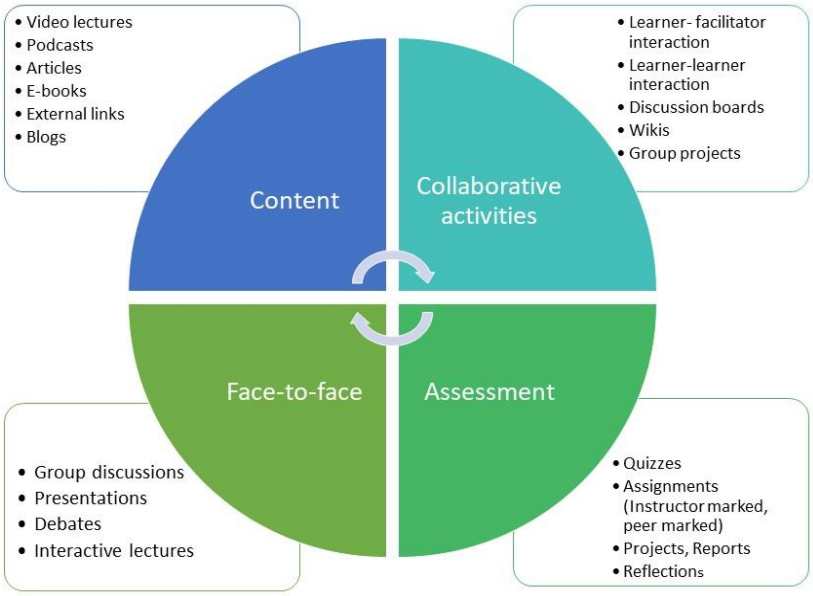


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Designing a blended learning session

The process of blended learning goes through the following steps in a cyclical manner: planning, designing, implementing, reviewing and improving. Fig. 6 shows some of the activities that can be incorporated into blended learning sessions:

Fig. 6: Examples of activities which can be included in blended learning



Questions to be asked while designing online activities

1. How will the learning activity support the intended learning outcomes?
2. What will motivate the learners to engage in online activities?
3. How can the facilitator motivate the learners and encourage to support one another in online learning?
4. Can a learner's activities and tasks be incorporated into continuous assessment, so that the learning activities can conform to the principles of student-centred learning?

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EXAMPLE

Here is an example of a blended learning module for undergraduate students of final MBBS (Part II):

BLENDED LEARNING MODULE ON CORONARY ARTERY DISEASE

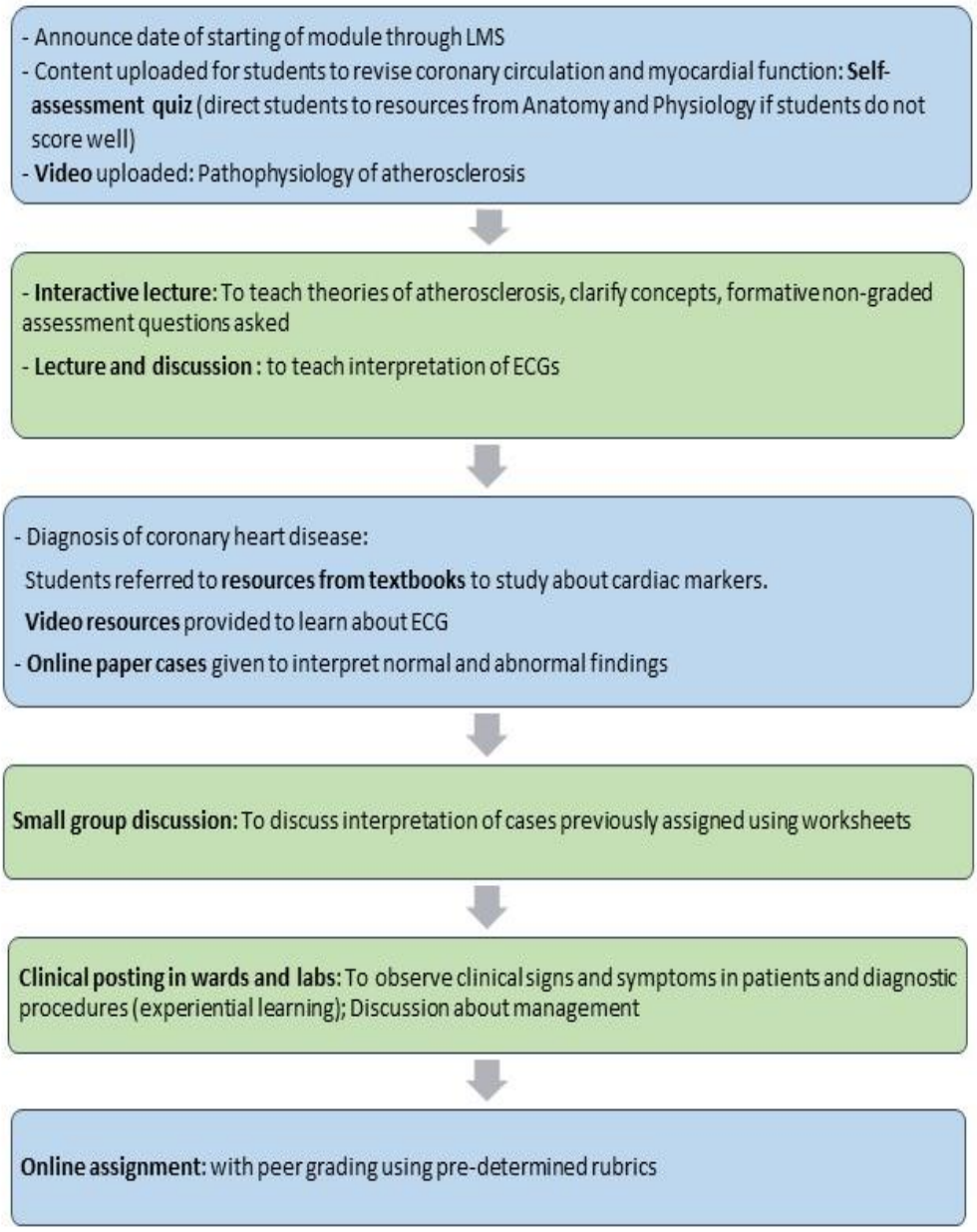
Learning objectives:
On the completion of this module, the learner should be able to:

- Describe the etiopathogenesis of coronary artery disease
- Choose the correct approach to diagnose coronary artery disease
- Apply the right medical and surgical approaches to manage a case of coronary artery disease

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Fig. 6: Online and face-to-face components of a blended learning module on coronary artery disease

- Face-to-face - Online component



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Advantages of Blended Learning

1. Improved content access to the learners,
2. Learner-centered teaching,
3. Improves communication, creativity, collaboration and critical thinking among learners,
4. Inculcate life-long learning skills,
5. Provides greater flexibility to the learners.

Challenges:

1. Creating infrastructure to deliver online contents,
2. Training faculty members in the process,
3. Providing accessibility to the learners,
4. Organizational culture and support.

Blended learning is an effective method which is student centric and provides flexibility to learners. It must be adapted to meet the needs of the new digitally savvy learners.

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EPILOGUE

The concept of triage

During the Covid- 19 pandemic, most faculty have been involved in clinical care, and learners had to be off campus due to safety concerns. Medical education had to take a back seat. Clinical teaching, specially, has been disrupted in these unprecedented circumstances. At a time like this, we will have to take some difficult decisions to cater to our immediate needs and mitigate the long-term negative consequences. We will have to evaluate the feasibility of what can be done and triage our resources. At all levels, we will have to determine: (a) what activities can be continued, (b) what activities should be postponed, (c) what activities can be adapted to another format and what remedial action/s need to be taken, (d) what activities should be dropped, and (e) what new activities need to be added.[61] For example, if clinical teaching cannot be conducted during the pandemic, one has to assess which parts can be converted into video or online teaching, and what needs to be postponed for later. Batches of students who have missed certain competencies must be taught and assessed on those competencies, once the campus is safe for on-site classes. If Covid- 19 related competencies were not being taught earlier, they have to be added to the curriculum. This kind of mapping of competencies where sacrifices and difficult choices to be made are charted out, is useful in a crisis. These kinds of negotiations must be made reflecting on the ultimate impact on medical education in the future.

Sharing resources

Since most institutes face a resource crunch, it is advisable to share resources such as instructional videos and skills laboratories between institutes. Preparing instructional videos is time consuming and needs trained resource faculty. Once these instructional videos are prepared, they can be reused, and a library of such videos can be developed as collaborative project between the institutions or Universities for common use. Colleges of one region can collaborate and create electronic question banks using the concept of consortia. All participating institutes will need to contribute good quality questions which are validated to the question bank. Administrative costs of maintaining the question bank can be shared between all participating institutes.

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BOARD of GOVERNORS in supersession of Medical Council of India

COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE



Curriculum Implementation Support Program

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Guidelines for preparing Logbook

for

Undergraduate Medical Education Program



Medical Council of India
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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

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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.

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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.

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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.

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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 Receive**d 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)

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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

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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

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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.

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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.**

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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.

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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

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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 Receive**d 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		

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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 Receive**d Initial of learner
PY6.8-6.10	Respiratory exam in normal	19-09-2019	F	B	R		Yes, Initial

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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

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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.

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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 Receive**d 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.

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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**

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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 Receive**d Initial of learner
PE 6.11	Visit to Adolescent Clinic	17-09-2019	F	M	C		

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Appendix I

Sample Logbook for professional year 1

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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)

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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:

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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.

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8	Subject: Biochemistry		
9	Extracurricular activities		
10	Sports / Physical Education		

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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 Receive**d 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)

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DN: C=IN, O=Personal, PostalCode=302033, S=Rajasthan, SERIALNUMBER=C973379113FC8D793F2708FC9D687F06B89F4196B9325326C00EECB6FEC22CC0, CN=SUSHIL KUMAR THAKUR
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Location: your signing location here
Date: 2024.09.19 15:53:04+05'30'
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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 Receive**d Initial of learner

Separate sheet(s) for Foundation Course, AETCOM, Humanities, Sports, extracurricular activities, subjects (as in the index) needed.

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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) expectations Exceeds (E) expectations	**Decision of faculty** Completed (C) Repeat (R) Remedial (Re)	**Initial of faculty and date**	**Feedback Receive**d Initial of learner

Separate sheet(s) for Foundation Course, AETCOM, Humanities, Sports, extracurricular activities, subjects (as in the index) needed.

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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					

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