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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

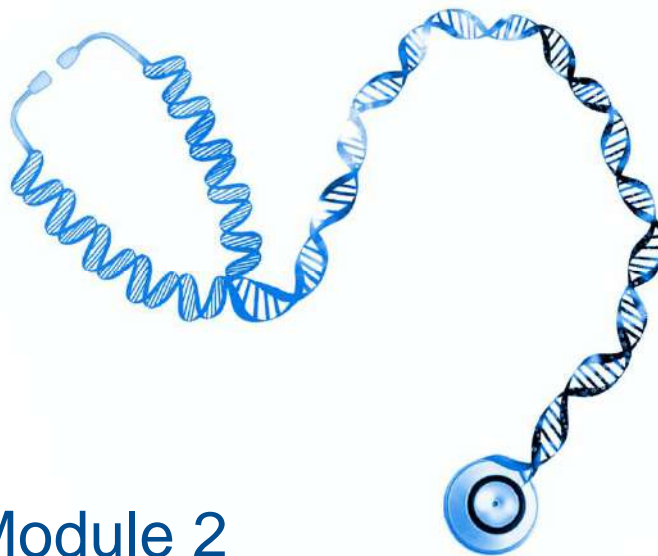
Integrate

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 Program

**Early Clinical Exposure for
Undergraduate Medical Education
Program
2019**



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

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Foreword

Early Clinical Exposure

The primary objective of medical education is to prepare students for a lifetime of patient care. The students must not lose this perspective through their years of study. One of the key requisites of a curriculum is providing relevance to learning. The competency driven curriculum developed for the MBBS program has several unique features that guides student learning by maintaining a focus on patients.

Early Clinical Exposure introduces some aspects of clinical and social contexts of patient care into the first year of undergraduate teaching program. The purpose of this program is to provide a reference to basic science learning so that students can understand the applicative aspects of learning. Importantly it helps to reinforce comprehension of normal and its altered expression and disease states.

Early patient contact by the student is desirable because it introduces the learner to the most important stakeholder in his or her career at a nascent time; this will hopefully provide the stimulus and encouragement required for the learner to focus on the task ahead. Simple designed programs - allowing patient interaction/context in a supervised setting - will facilitate the student to learn from patient's perception of illness, its effect on health, its impact on family relationships and well-being and professional activity. Providing such opportunities for "immersive learning" early in the curriculum will shape the learner's commitment to care, empathy, altruism and service, the guiding principles enshrined in the new curriculum.

Introduction of Early Clinical Exposure in the undergraduate curriculum fulfills a long standing request of educators. This booklet incorporates some ideas and best practices gleaned from experts and institutions across the country. We are confident that each institution will add to this corpus of experience, their own lessons, cases and modules and hopefully share them with other institutions.

The Early Clinical Exposure program is designed to enrich the learning experience of the student and provide him or her tools that will not only strengthen the foundation laid in the first phase, but also bring to focus the larger import of learning done in that phase to future phases and career. We are grateful to the members of the Expert Group and the Academic Cell for painstakingly putting this booklet together. We hope that teachers and institutions will benefit from the suggestions provided herein and can successfully adapt and apply them into their own environment.


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Foreword

Early Clinical Exposure

This booklet provides a suggested pattern for the Early Clinical Exposure component for the MBBS program commencing 2019. The Early Clinical Exposure component allows students to understand basic science from an applicative perspective. The ability to learn concepts with their future application will generate interest and provide for greater retention and comprehension in the learner. One key aspect of this component is provision of authentic human contact. Exposure to patients and their families early will be a great influence on the professional and personal development of students and provide a stimulus to improved learning.

This booklet has been developed by experts invited by the Board of Governors in super session of the MCI and incorporates their vast expertise and experience. The time and effort spent in creating this guide that can be used by institutions to develop their own learning process and content is gratefully acknowledged. Appreciation is also due to the efforts of the Academic Cell and of the faculty at various Regional and Nodal centers who worked tirelessly to ensure that the new competency driven curriculum and its various unique components are implemented fully and flawlessly across the medical colleges in the country.

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Curriculum Implementation Support Program

Module – 2

EARLY CLINICAL EXPOSURE

Early Clinical Exposure

Guidelines for Universities, Curricular Committees and Faculty

Early Clinical Exposure (ECE) provides a clinical context and relevance to basic sciences learning. It also facilitates early involvement in the healthcare environment that serves as motivation and reference point for students, leading to their professional growth & development.

1. Objectives of the Document are to:

- Describe the modalities of applications of ECE in a medical college
- Facilitate the development of modules of ECE for students
- Facilitate Implementation of ECE in their medical college

2. Introduction:

Students require context to understand basic sciences. They also require grounding in human and social aspects of the practice of medicine. Early clinical correlation and exposure to clinical environment will provide a point of reference and relevance to the novice learner. The ECE program in the MBBS curriculum tries to create an opportunity for students to correlate learning in Phase I subjects with their clinical application. Learning of basic sciences with respect to a clinical context can improve student's motivation to learn and also improve retention. It also provides authentic human context and early introduction to immersion into the clinical environment.

The MBBS curriculum has therefore been modified such that clinical exposure can be introduced earlier along with the basic sciences. Students will be able to learn the basic and clinical sciences by means of integrating learning activities, like early clinical contact, clinical skills, communication skills or task-based learning sessions.

Students can be exposed to clinical experiences in various forms and in a variety of settings which are outlined in this booklet. This does not reduce the

importance of traditional basic science instruction, but enriches and contextualizes the learning for the students.

3. Objectives of Early Clinical Exposure:

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

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

4. Elements of ECE:

The three elements of ECE are:

1. Provision of clinical correlation to basic sciences learning.
2. Provision of authentic human contact in a social or clinical context that enhances learning in the early/pre-clinical years of undergraduate education.
3. Introduction to humanities in medicine

Salient Principles:

The key principles underlying early clinical exposure are providing a clinical context and ensuring patient centrality. Early clinical exposure provides for the three key elements listed above. The clinical context can include case scenario, videos, actual patient, simulated patient etc. The presence of actual patients in every sessions of ECE, though not essential, is preferred. Therefore, ECE is exposure to the relevant clinical context in earlier years. It must be noted

that purpose of ECE is not to prepone the conventional clinical teaching but to provide better understanding of basic sciences through a clinical context.

5. Context from proposed GMER 2019:

9.2.1 Objectives:

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

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

9.2.2 Elements:

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

6. Structure of the program for students:

Planning of activities & its distribution

It would be desirable to plan all teaching learning sessions in basic sciences around a clinical scenario so that students understand its relevance. But the clinical scenario in ECE should not be restricted to just the initial part of the teaching sessions, but form a framework around which learning will occur.

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

- 1. Basic sciences correlation (18 hours):** One three hour session per month for 6 months may be allotted. The clinical context can be introduced using actual patient contact or by use of paper based cases, charts (e.g. use of spirogram, electromyogram with its clinical correlation), graphics (e.g. using photos of gigantism/hypothyroidism/ Cushing's syndrome in endocrinology), videos (e.g. videos depicting normal & abnormal respiratory movements, embryology, endoscopy, laryngoscopy etc.), reports (e.g. blood/urine reports indicating biochemical markers), field visits etc. in community/ hospital laboratories.
- 2. Clinical skills (experience and human context) (12 hours):** Three hour session per month for 4 months per department may be allotted. Cases may be demonstrated by preclinical faculty or clinicians, in out-patient departments/ wards/ demonstration rooms, as feasible, in small groups.

Each 3-hour session of clinical experience can follow the guidelines below:

- Introduction to the module & instruction by preclinical faculty: 30 minutes

- Clinical experience (in groups at different places like wards/OPDs/classrooms with guided observation/checklist): 1 hour 30 minutes
- Summary & conclusion (with learning points): 30 minutes
- Reflection (with guidance & monitoring) on what was learnt: 30 minutes

Examples of clinical context and related learning outcomes are provided in **Annexure I**.

Examples of deviations from normal to be observed and noted by student when exposed to clinical context are given in **Annexure II**. These can be used while preparing observation guides.

It is important to finalise a detailed observation guide for students and instruct them, before the actual interaction, regarding what he/she is supposed to observe during the ECE session. In observation guide, list out clinical features the student has to focus in the particular context. You may refer to the sample modules for ECE given in **Annexure III**.

- 3. Humanities:** This will be merged with AETCOM module and therefore no additional time is allotted.

A sample for Humanities module is attached in **Annexure IV**

7. Formative & Internal Assessment:

Formative assessment will have a major role in the teaching of Early Clinical Exposure. The assessment must focus on students' activities during ECE. Students will participate in various activities such as case based scenarios, live patient's interactions, simulated patients, videos etc. A record of these activities should be maintained and assessed periodically.

Elements from ECE should be included as appropriate in formative and summative assessments of the respective subjects.

A) Internal Assessment:

Early Clinical Exposure should be part of internal assessment for the respective subject. During assessment, questions should test clinical correlation in basic sciences.

B) University Examinations:

It is suggested that examinations should include elements from ECE to test the ability of the student to apply basic science knowledge in clinical context.

The Modified Essay Questions (Problem based long answer questions), Clinical vignette based Short Answers Questions (SAQ), objective type questions (e.g. Multiple Choice Questions - MCQs) and OSPE can include parts of ECE. **Annexure V** gives examples of clinical vignette based short answer questions.

8. Capacity Building for Faculty:

Faculty Development:

Faculty need to be reoriented to the principles and practice of early clinical exposure. Preclinical and clinical faculty need to coordinate and involve in the activities related to hospital visits. Clinical faculty may be involved in the planning of ECE sessions. Faculty should be trained to develop, implement and assess ECE which is relevant to their subjects and phases including setting question papers, use of case based questions, assessing clinical context in earlier years and applications of the ECE.

9. Implementation, Monitoring / Curricular Governance:

Planning, Implementation and oversight of ECE is the responsibility of the Curriculum Committee of the college. The Curriculum Committee (CC) will work

in collaboration with phase-wise curriculum subcommittee (CSC), and Heads of departments to plan the ECE sessions and coordinate hospital visits.

Responsibilities of Principal/Dean

- Hold regular meetings of the Curriculum Committee and Heads of Departments
- Ensure implementation of ECE & monitor its activities.

Responsibilities of Head of Departments

- Function as Coordinator of ECE program in their disciplines

Responsibilities of Curriculum Committee

- To review regularly and record ECE activities & make necessary changes /adjustments as required from time to time.
- To help in scheduling ECE sessions for class-room, hospital & community visit
- To ensure that the competency based UG curriculum is implemented by all departments as per MCI guidelines.

Responsibilities of MEU

- To arrange the sensitization programs for all faculty members (including the Principal/Dean, Heads of departments of pre-clinical & related clinical departments)
- To train and orient the resource persons

10. Further Reading:

List of resources

Must read

1. Başak O, Yaphe J, Spiegel W, Wilm S, Carelli F, Metsemakers JFM. Early clinical exposure in medical curricula across Europe: An overview. *Eur J Gen Pract.* 2009 Jan 1;15(1):4–10.

Additional reading

2. Dornan T, Littlewood S, Margolis SA, Scherpbier A, Spencer J, Ypinazar V. How can experience in clinical and community settings contribute to early medical education? A BEME systematic review. *Med Teach.* 2006 Feb; 28(1):3–18.
3. McLean M. Sometimes we do get it right! Early clinical contact is a rewarding experience. *Educ Health Abingdon Engl.* 2004 Mar; 17(1):42–52.
4. Abramovitch H, Shenkman L, Schlank E, Shoham S, Borkan J. A tale of two exposures: a comparison of two approaches to early clinical exposure. *Educ Health Abingdon Engl.* 2002;15(3):386–90.
5. Kachur EK. Observation during early clinical exposure – an effective instructional tool or a bore? *Med Educ.* 2003; 37(2):88–9.
6. MacLeod RD, Parkin C, Pullon S, Robertson G. Early clinical exposure to people who are dying: learning to care at the end of life. *Med Educ.* 2003; 37(1):51–8.
7. Duque G, Gold S, Bergman H. Early Clinical Exposure to Geriatric Medicine in Second-Year Medical School Students—The McGill Experience. *J Am Geriatr Soc.* 2003; 51(4):544–8.
8. Johnson AK, Scott CS. Relationship between early clinical exposure and first-year students' attitudes toward medical education. *Acad Med J Assoc Am Med Coll.* 1998 Apr; 73(4):430–2.
9. Vyas R, Jacob M, Faith M, Isaac B, Rabi S, Sathishkumar S, et al. An effective integrated learning programme in the first year of the medical course. *Natl Med J India.* 2008; 21(1):21–6.
10. Sathishkumar S, Thomas N, Tharion E, Neelakantan N, Vyas R. Attitude of medical students towards Early Clinical Exposure in learning endocrine physiology. *BMC Med Educ.* 2007 Sep 5; 7:30.

11. Badyal DK and Singh T. Teaching of the basic sciences in medicine: Changing trends. –The changing trends. National Medical Journal of India. 2015; 28(3):137-40.

Annexure I

Examples of clinical context and related learning outcome

Clinical Context	Outcome
<p>Parkinson's disease (Neurophysiology) <i>Patient/video/simulated patient/role play</i></p>	<ol style="list-style-type: none"> 1. Demonstrate understanding of alterations in normal functions of Basal ganglia and their clinical expression. 2. Explain anatomical and physiological basis of signs & symptoms of Parkinson's disease 3. Observe examination of Motor system (Tone of the muscles) in a patient with Parkinson's disease
<p>COPD (Respiratory Physiology) <i>Patient/video/investigations</i></p>	<ol style="list-style-type: none"> 1. Demonstrate understanding of alterations in normal respiratory physiology and anatomy in chronic obstructive lung disease and their clinical expression. 2. Explain the concept of restrictive and obstructive lung disease
<p>Ascites (Abdominal system) <i>Patient/video/USG</i></p>	<ol style="list-style-type: none"> 1. Demonstrate understanding of alterations in normal physiology and anatomy in portal system and their clinical expression. 2. Observe tests for eliciting presence of fluid in abdomen

<p>Claw hand, Foot drop, Carpal tunnel syndrome (Peripheral nerve injuries) Patient/ video</p>	<ol style="list-style-type: none"> 1. Demonstrate understanding of alterations in normal anatomy & function of these nerves and their clinical expression. 2. Observe tests for eliciting normal function of these nerves
<p align="center">Clinical Context</p>	<p align="center">Outcome</p>
<p>Varicose veins (Venous drainage of the lower limbs) <i>patient/video</i></p>	<ol style="list-style-type: none"> 1. Demonstrate understanding of alterations in normal anatomy and physiology in peripheral venous system and their clinical expression 2. Demonstrate understanding of principles behind clinical examination of varicose veins
<p>Type 2 Diabetes mellitus (T2DM) (Nutrition & Biochemical Lab tests) <i>patient/ Lab investigations</i></p>	<ol style="list-style-type: none"> 1. Demonstrate understanding of alterations in metabolism and physiology in diabetes mellitus and its clinical expression 2. Explain the basis and rationale of biochemical tests done in diabetes mellitus
<p>Obesity (Nutrition) <i>Video/Clinical parameters</i></p>	<ol style="list-style-type: none"> 1. Demonstrate understanding of alterations in Metabolism and physiology in over nutrition and its clinical expression 2. Explain to the population the health risks associated with being overweight/obesity 3. Describe the metabolic and endocrine consequences of obesity.

Annexure II

Examples of deviations from normal, to be observed and noted by the student, when exposed to clinical context.

Example of the Disease / Disorder	Deviations from normal, to be observed and noted by student, when exposed to clinical context. The students should be able to compare abnormal and normal
Cerebellar dysfunction	Tremor, abnormalities of coordination, tone of muscles, findings on elicitation of knee jerk, ocular signs, abnormality in performing alternate rapid movements
Pneumonia	Presence of adventitious sounds on auscultation
Pleural Effusion	Position of mediastinum, findings on percussion, abnormalities of breath sounds
Arthritis	Swelling / Oedema & tenderness in the affected joint, restricted & painful joint movements
Jaundice/Anaemia	Examination for icterus /Pallor- site and colour
Cushing's syndrome	Moon face, hirsutism, striae, buffalo hump

Annexure III

Sample Modules for ECE

ECE Module 1: Acute Myocardial Infarction (AMI)

Setting: Class room

Topic of Basic Science: Coronary Circulation

ECE through- Acute Myocardial Infarction case(Paper based case / Role play)

Goal:

The student must be able recognize the relevance of coronary circulation in diagnosis, patient care and treatment of Acute MI

Expected Competency:

1. Demonstrate understanding of alterations in normal anatomy and physiology of coronary circulation and its clinical expression.
2. Correlate the clinical manifestation in myocardial infarction with altered coronary circulation
3. Explain the basis and rationale of biochemical tests done in myocardial infarction.

Objectives:

At the end of the ECE module I MBBS student shall be able to:

- 1) Describe the mechanism of regulation of coronary circulation.
- 2) Describe the role of lipoproteins in derangement of coronary circulation.
- 3) Explain the biochemical changes occurring in acute myocardial infarction
- 4) Identify the clinical manifestation secondary to decreased coronary circulation.
- 5) Explain the basis of treatment of acute myocardial infarction

Learning Experiences:

Total time: 3 hours

- Introduction and instruction to students: 20 mins.

- Exposure to clinical context and discussion:90 mins
- Summary and conclusion: 10 mins
- Reflection: 30 mins
- Assignment: 30 mins

ECE: Classroom setting: 3 hours

Clinical Context:

A 48 year old company executive experienced a sudden, crushing chest pain, after he returned from his morning walk. His wife noticed that he was pale, sweating profusely and was in distress. She rushed him to the ICU of a nearby hospital immediately. He told the attending physician that on previous occasions too he had felt such pain but he it had subsided with rest. He is known smoker. He also suffers from diabetes, dyslipidemia and hypertension. ECG was taken & it showed ST elevation in leads II, III and AVF. He was admitted in the ICU.

**This clinical scenario can be either used as a paper based case or be performed as a role play if feasible.*

Facilitator's guide:

- *What is the probable reason for the severe pain in chest?*
- *Why did the regulatory mechanisms fail to meet increased demand of Oxygen ?*
- *How are diabetes Mellitus, hypertension and cardiac ischemia related?*
- *What do the changes in ECG indicate?*

Lab report:

Various investigations carried out 4 hours after the onset showed

- Raised cardiac specific troponin T & I
- Raised CK-MB
- Raised Cholesterol (Total, LDL and Triglycerides)

** get an actual lab report copy of a patient of Acute Myocardial infarction admitted at your hospital and use the same taking care not to disclose the identity.*

Facilitator's guide:

- Why are the cardiac Biomarkers raised?
- *What do the serum lipid levels indicate?*
- *What is the role of dyslipidemia in disruption of coronary circulation?*
- *What will be the next steps to manage acute MI?*

Formative assessment:

Submit assignment on the topic anatomical and physiological basis of treatment of acute myocardial infarction.

Reflections can be structured using the following guiding questions

- What happened? (What did you learn from this experience)
- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Program Evaluation:

- ✓ Feedback from students to evaluate for improvements in the module
 1. How helpful has the ECE module been in improving your knowledge about coronary circulation?
 2. Which components of the program helped you to learn?

3. Did the ECE module make learning basic science subjects more interesting?
 4. Are you motivated to read further on this topic as a result of participating in ECE?
 5. Suggest changes in the program that will help you learn still better.
- ✓ Written feedback from the faculty regarding their opinion as to whether outcomes were achieved and suggestions to improve the program

Resources

Appropriate text resources to be identified by the institutional subject experts.

ECE Module 2: Post - Myocardial Infarction Counseling

Setting: OPD

Topic: Coronary Circulation

ECE through- Post -Myocardial Infarction Counseling (**OPD visit**)

Goal:

The student must realize the relevance of basic sciences in patient care and relate to experience of patients as a motivation to learn

Expected Competency:

1. Demonstrate knowledge of process of counseling and communicating to patients with empathy, the dietary modifications and lifestyle changes in post coronary syndromes

Objectives:

At the end of the ECE module I MBBS student shall be able to:

1. Explain the basis of necessary dietary and life style modification to be undertaken in a patient recovering from Acute MI
2. Identify the salient features of effective communication between doctor and patient
3. Realize the impact of illness on patient's life

Learning Experiences:

- Introduction and instruction to students: 20 mins
- Exposure to clinical context: 45 mins
- Discussion: 45 mins
- Summary and conclusion: 10 mins
- Reflections: 30 mins
- Assignment: 30 mins

Part I - OPD setting: 45 mins

The Preclinical departments should arrange rotation of students to the OPD in collaboration with Medicine/ Cardiology / Cardiac Rehabilitation departments. Visits should be arranged in small groups so as to offer a better clinical experience. The clinicians should be made aware of the objectives of module. Patients recovering from Acute Myocardial infarction either treated with medications or interventions can be the focus for learning.

Observation Guide:

Students can be divided to observe different aspects of the doctor patient interaction and share ideas in post-clinic discussion.

Instructions to the students: During the consultation with a post-myocardial infarction patient, observe the interaction carefully.

Observation Guide to group A

Note down the lifestyle and dietary modifications advised by the doctor to prevent reoccurrence of MI.

Observation guide to group B

Observe the communication between the doctor and patient and list all the points in this interaction that helped the patient understand the information being shared. Also list the points that could be done to help the patient further.

Patient Interview:

Encourage one of the students in the group to interview the patient regarding how this illness has impacted his/her life.

Part II: Post clinic discussion: 45 mins

In small groups

- Students observing different aspects will share ideas.
- Facilitator must take care to give an opportunity to all students to voice their observations.

- All points emerging must be noted down on black board/ whiteboard during discussion.
- Facilitator to encourage the students to discuss the reasons for the dietary and life style modification to be undertaken in a patient recovering from Acute MI.
- Facilitator will also discuss the points of effective communication between doctor and patient, focusing on the importance of explaining in a way the patient understands.

This can be linked with module 1.4 of AETCOM - the foundations of Communication-1 and used for introducing or reinforcing the principles of effective communication.

For discussing points of effective communication, the Kalamazoo consensus statement which provides a working model for teaching communication skills can be used.

1. Builds relationship
2. Opens the discussion
3. Gathers information
4. Understands the patient's perspective
5. Shares information
6. Manages flow

The other option is to use the Five A's behavior change model for health behavior change counseling to improve chronic illness care- Assess, Advise, Agree, Assist, Arrange.

- Discuss about how this illness affects the patient's life.
- At the end the student is asked to reflect on the experience and write it down in the log book.

Formative assessment:

- **Clinical skills:** Doctor patient communication can be assessed using Log book to record the patient details in the clinical experience. Reflections about

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

Reflections can be structured using the following guiding questions

- What happened? (What did you learn from this experience)
- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Program Evaluation:

- ✓ Feedback from students to evaluate for improvements in the module:
 1. How helpful has the ECE module been in improving your knowledge about lifestyle changes post myocardial infarction?
 2. Which components of the program helped you to learn?
 3. Did the ECE module make learning basic science subjects more interesting?
 4. Are you motivated to read further on this topic as a result of participating in ECE?
 5. Suggest changes in the program that will help you learn still better.
- ✓ Written feedback from the faculty regarding their opinion as to whether outcomes were achieved and suggestions to improve the program

Resources:

1. Makoul G. Essential elements of communication in medical encounters: the Kalamazoo consensus statement. Acad Med. 2001; Apr; 76(4): 390-3.
2. Vallis, Michael et al. "Clinical review: modified 5 As: minimal intervention for obesity counseling in primary care" Canadian family physician Medecin de famille canadien vol. 59, 1 (2013): 27-31.

ECE Module 3: Parkinson's disease

Setting: OPD/ Classroom

Topic: Role of Basal Ganglia in Voluntary control of posture and movement

ECE through: Parkinson's disease (actual patient/ video)

Goal:

The student must realize the relevance of basic sciences in patient care and relate to experience of patients as a motivation to learn.

Expected Competency:

1. Demonstrate understanding of alterations in normal functions of Basal ganglia and its clinical expression.

Objectives:

At the end of the ECE module I MBBS student shall be able to:

1. Explain anatomical, biochemical and physiological basis of symptoms and signs of Parkinson's disease
2. Explain the difference between pyramidal and extrapyramidal lesions
3. Observe the examination of motor system

*Please note that teaching-learning of the clinical skills must be supplemented by a DOAP session (Demonstrate Observe Assist Perform) on examination of Motor system or preceded by it, as feasible, so that the student is able to demonstrate the correct clinical examination of the motor system ultimately.

Learning Experiences:

- Introduction and instruction to students: 20 mins
- Exposure to clinical context and Discussion: 90 mins
- Summary and conclusion: 10 mins
- Reflections: 30 mins
- Assignment: 30 mins

ECE: Classroom setting: 3 hours

Actual patient/simulated patient with Parkinson's disease can be invited to the classroom or a video recording of the history and physical examination can be shown to the students as per feasibility.

Observation Guide:

Instructions to the students:

- During the consultation, listen carefully to the patient's complaints. Note the onset, duration and progress of these symptoms.
- Observe the physical examination carried out and note down the salient features of the examination.
- Try to find an explanation for his/her symptoms and signs.

Part II: Post clinic discussion: 1 hr

In small groups:

- Students will share their observations
- Facilitator must take care to give an opportunity to all students to voice their observations.
- All points emerging must be noted down on black board/ whiteboard during discussion
- Facilitator discusses the patient's history –onset of tremors and parts affected history of falls, poor balance, muscle stiffness, drooling of saliva, difficulty in writing, loss of memory along with change in voice and the basis of signs like: mask-like face, pill rolling movement, festinant gait and cog wheel rigidity.
- Facilitator also discusses the technique of examination of tone in the patient.
- At the end, the student is asked to reflect on the experience and write it down in the log book.

Formative assessment:

Basic Science correlation: To be assessed on the basis of assignment on 'Treatment options for the Shaking Palsy'

Reflections can be structured using the following guiding questions:

- What happened? (What did you learn from this experience)
- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Program Evaluation:

- ✓ Feedback from students to evaluate for improvements in the module
 1. How helpful has the ECE module been in improving your knowledge about Parkinson's disease?
 2. Which components of the program helped you to learn?
 3. Did the ECE module make learning basic science subjects more interesting?
 4. Are you motivated to read further on this topic as a result of participating in ECE?
 5. Suggest changes in the program that will help you learn still better.
- ✓ Written feedback from the faculty regarding their opinion as to whether outcomes were achieved and suggestions to improve the program

Resources:

Appropriate text resources to be identified by the institutional subject experts.

ECE Module4: Varicose Veins

Setting: Classroom & OPD

Topic of Basic Science: Front of Thigh / Veins of Lower limb

ECE through- Varicose vein case (Video / Patient)

Goal:

The student must be able recognize the clinical manifestations of altered anatomy of venous system.

Expected Competency:

1. Demonstrate understanding of alterations in normal anatomy and physiology in peripheral venous system and its clinical expression
2. Demonstrate understanding of principles behind clinical examination of Varicose veins

Objectives

1. Discuss the clinical manifestation of impaired venous drainage in Lower limb
2. Explain the basis of treatment of Varicose veins

Learning Experiences:

- Introduction and Instruction to students: 20 mins
- Exposure to clinical context and discussion: 90 mins
- Summary and conclusion: 10 mins
- Reflections: 30 mins
- Assignment: 30 mins

**ECE: Classroom setting: 3
hours**

A 40-year old male, bus conductor noted dilated engorged tubular structures over his calf and thigh region. These were becoming prominent after a long time standing posture.

****This clinical scenario can be used as either, a paper based case supplemented by video or on actual patient if feasible.**

Facilitators guide:

- *What are these dilated engorged tubular structures?*
- *Why do these develop in lower limb only?*

Clinical Examination:

Trendelenburg's test and other clinical tests

****Perform Trendelenburg's test on actual patient, if available.**

Facilitators guide:

- *What are the steps to perform Trendelenburg's test? What is anatomical basis for these tests?*
- *Which veins can be tested by this method and why?*
- *What will be the steps to manage varicose veins?*

Formative assessment:

- Structured Long answer question on veins of lower limb
- OSCE for demonstration of Trendelenburg's test
- Submit assignment on the topic medical and surgical basis of treatment of varicose veins.

Reflections can be structured using the following guiding questions:

- What happened? (What did you learn from this experience)

- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Program Evaluation:

- ✓ Feedback from students to evaluate for improvements in the module
 1. How helpful has the ECE module been in improving your knowledge about varicose veins?
 2. Which components of the program helped you to learn?
 3. Did the ECE module make learning basic science subjects more interesting?
 4. Are you motivated to read further on this topic as a result of participating in ECE?
 5. Suggest changes in the program that will help you learn still better.
- ✓ Written feedback from the faculty regarding their opinion as to whether outcomes were achieved and suggestions to improve the program

Resources

Appropriate text resources to be identified by the institutional subject experts.

ECE Module 5: Type 2 Diabetes mellitus (T2DM)

Setting: Class room /OPD

Topic of Basic Science: Carbohydrate Metabolism

ECE through: Type 2 Diabetes Mellitus Case (Role play/ Paper based case/ actual Patient)

Goal: The student must be able recognize the clinical manifestations of altered carbohydrate metabolism

Expected Competency

1. Demonstrate understanding of alterations in metabolism and physiology in diabetes mellitus and its clinical expression
2. Explain the basis and rationale of biochemical tests done in diabetes mellitus

At the end of the ECE module I MBBS student shall be able to:

1. Explain the significance of estimating Blood glucose level, urine glucose and ketone bodies and HbA1c
2. Discuss the role of HbA1c in management of diabetes mellitus
3. List the guidelines to collect blood sample for glucose estimation
4. Interpret the results of the Blood glucose test, Urine glucose,urine ketones and HbA1c
5. Demonstrate the use of glucometer to estimate blood glucose level

Learning Experience:

Total 3 hours

1. Introduction & Instruction 20 mins
2. Exposure to clinical content and discussion in small groups 60 mins
3. DOAP - use of glucometer for estimating blood sugar level 30 mins
4. Summary & Conclusion 10 mins
5. Reflection &Assignment 30 mins

ECE Classroom setting:3 hours

Mr. Shukla, a 45 year old businessman was happy that he had lost 4 kg weight in last 2 months. He felt he was losing weight as he had started drinking more water than usual though he kept feeling hungry all the time. Maybe getting up at night too to empty his bladder was disturbing his sleep and made him feel tired all through the day.

His physical examination and lab investigations carried out as part of the yearly health checkup showed the following significant findings:

BMI: 28

Fasting Plasma Sugar: 180 mg/dl

Urine Sugar: absent

Postprandial Plasma Sugar: 230 mg/dl

Urine Sugar: +

Urine ketones: absent

HbA1c: 7.9 %

He was asked to follow up with a physician so he has come to your OPD.

**Perform this clinical scenario as a role play. You may distribute copies of a mock lab report to aid discussion.*

Facilitator's Guide:

- *Explain what is happening with Mr.Shukla. What are alterations in normal physiology/ biochemistry that can explain clinical presentation of Mr. Shukla?*
- *Why is urine sugar absent in fasting sample?*
- *Explain the significance of raised HbA1c and high BMI in a patient of Type 2 DM*
- *Why should the blood sample for glucose be collected in fluoride -EDTA bulb or tube (grey).*

The facilitator will then have a DOAP session (Demonstrate Observe Assist Perform) on use of glucometer to estimate blood glucose levels

Formative assessment:

Basic Science correlation: To be assessed on the basis of assignment on 'Diabetes - A metabolic disorder'

Reflections can be structured using the following guiding questions:

- What happened? (What did you learn from this experience)
- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Program Evaluation:

- ✓ Feedback from students to evaluate for improvements in the module
- ✓
 1. How helpful has the ECE module been in improving your knowledge about disorders of carbohydrate metabolism?
 2. Which components of the program helped you to learn?
 3. Did the ECE module make learning basic science subjects more interesting?
 4. Are you motivated to read further on this topic as a result of participating in ECE?
 5. Suggest changes in the program that will help you learn still better.
- ✓ Written feedback from the faculty regarding their opinion as to whether outcomes were achieved and suggestions to improve the program

ECE Module 6: Acid -Base Disorder

Setting: Class room & Clinical Biochemistry Laboratory

Topic of Basic Science: Acid -Base Balance

ECE through: Acid -Base Balance Disorder Case (paper based case)

Goal: The student must be able recognize the clinical manifestations of altered acid base balance

Expected Competency:

1. Describe the processes involved in maintenance of normal pH of body fluids and the derangements associated with these.
2. Discuss and interpret results of Arterial Blood Gas (ABG) analysis in various disorders.
3. Observe use of ABG analyzer.

At the end of the ECE module I MBBS student shall be able to:

1. Explain the basis of the biochemical changes noted due to compensatory mechanisms in various acid base disorders.
2. Describe the use of ABG analysis and Serum electrolyte values in diagnosis of acid base disorders.
3. Describe and interpret the results of the ABG analysis in the different types of Acidosis and Alkalosis.
4. Describe the Principle of Arterial Blood Gas (ABG) analyzer

Learning Experience:

Total 3 hours

- | | |
|--|-------------|
| 1. Introduction & Instruction - | 15 mins |
| 2. Exposure to clinical content and Discussion | 1hr 30 mins |
| 3. Demonstration of working of ABG analyzer | 30 mins |

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

ECE Classroom setting: Objectives 1-3 can be achieved with the help of the following case and Objective 4 can be demonstrated in the Clinical Biochemistry Laboratory.

Part 1:

Mrs. Rajashree is a 45 year old teacher. She was suffering from severe diarrhea for the last 5 days. The stools were watery and copious. She also complained of fatigue and shortness of breath since morning.

Facilitator’s Guide:

- *What is the critical course of events that will alter her acid base status?*
- *What acid base abnormalities would you expect in her based on above information?*
- *What physical findings would you expect from this acid base disturbance?*

Part 2:

Her blood reports were as follows:

Fasting Blood Sugar: 100 mg/dl	PaCO ₂ : 30 mmHg
pH: 7.24	Cl ⁻ : 106 meq/L
HCO ₃ ⁻ : 15 meq/L	Na ⁺ 134 meq/L
	K ⁺ : 4.2 meq/L

Facilitator’s Guide:

- *Review the Biochemical report. What is the primary abnormality? How did you decide that?*
- *What are alterations in normal physiology/ biochemistry that can explain clinical presentation of Mrs. Rajashree ?*
- *Is the compensatory response observed?*
- *Calculate the anion gap and interpret the findings.*

Part 3:

Laboratory Visit:

The students to observe the working of an ABG analyser in the Laboratory

Facilitator's Guide:

- Facilitator will demonstrate the working of an ABG analyzer and explain its principle.

Formative Assessment:

Students can be given various ABG reports to interpret and explain the compensatory response that would occur.

Reflections can be structured using the following guiding questions:

- What happened? (What did you learn from this experience)
- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Programme Evaluation:

- ✓ Feedback from students to evaluate and modify program
 1. How helpful has the ECE module been in improving your knowledge about Acid- Base disorders?
 2. Which components of the program helped you to learn?
 3. Did the ECE module make the basic science subjects learning more interesting?
 4. Are you motivated to read further on this topic as a result of participating in ECE?
 5. Provide suggestions to improve leaning further.
- ✓ Written feedback from the faculty regarding their opinion as to whether outcomes were achieved and suggestions to improve the program

Annexure IV

Humanities Module

Study of medical humanities plays a pivotal role in preparing students to practice in the community. It develops the students' capacity to listen, interpret and communicate with patients. Appreciating the subjective aspects of a person's health and illness will enable them to offer individualised care. It will also provide a channel to the students to express themselves through creative mediums of literature, music and arts.

Literature and Medicine

Background

Medicine is an integral part of literature - classic popular and science fiction. A whole genre of medical fiction exists which reflects the community's view of the medicine, its system and health care workers. Literature also portrays human suffering and gives learners perspectives quite different from that obtained from teachers. Many doctors are prolific writers and have written about personal suffering as well as the impact of medicine. The module allows the learner to explore medicine and human suffering from a literary perspective.

Competency addressed

The learner must explore, discuss and reflect on human illness suffering and medicine as portrayed in literature (classic/contemporary)

Learning Session

Year of Study: 1

Hours: 8 hours

Exploratory session: 2 hours

Self-directed Learning: 4 hours

Research / Task / Report

Discussion and closure: 2 hours

Description:

1. An exploratory session is created where either in small groups or an interactive large group, students are allowed to speak about the portrayal of suffering illness and health care workers and the system as portrayed in classic and contemporary literature. Evoke questions about regional literature in particular. Explore differences in portrayal of doctors in classic vs. contemporary literature. Evoke a discussion about doctors accounts of their own suffering
2. Students, individually or in groups, are asked to choose and read and report on a book that has affected their view of the illness, suffering or the medical profession
3. **Discussion and closure:** A closure session where students share their reflection based on their tasks and learnings and their implications

Assessment

Submitted Narrative and reflections

Annexure V

Clinical vignettes for short answer questions

Sample 1

A 55 year old man complained to his general practitioner that he felt tired easily. He also complained of dizziness, sweating and palpitations after meals. He had undergone partial gastrectomy seven years ago involving removal of major part of body and fundus of the stomach. Since last 2.5 years he had stopped taking Vit B₁₂ injections.

Q. Explain the physiological basis of:

- a. Need of Vit B₁₂ injections after partial gastrectomy involving fundus and body of stomach.
- b. Symptoms of dizziness, sweating and palpitations observed after a meal in this patient.

Sample 2

A 35 year old male patient reports to the out-patient department with complaints of increasing stretch marks and muscular atrophy. He also complained of increased weight gain especially on the upper back area.

Q.a. Explain the biochemical features **expected** in this patient.

Q.b. Explain the biochemical basis of the tests used to confirm and further evaluate the cause of this condition.

Sample 3

A patient with a diagnosis of leprosy came to the hospital with complaints of absence of sensation in right hand. Clinical examination showed sensory loss in medial one and half finger & medial side of palmar-dorsal aspects of right hand. There was also flattening of hypothenar eminence & difficulty in holding paper tightly between the affected fingers on right side.

- Q.a. Mention the affected structure.
- Q.b. Describe branches and area of distribution of the affected structure in hand.
- Q.c. Explain the anatomical basis of flattening of hypothenar eminence.
- Q.d. Explain the difficulty in holding of paper tightly between fingers on right side.