



CBME: THE NEW TRADITION CURRICULUM IN PHYSIOLOGY FOR MBBS

Physiology

Dr. Sujata A. Gaikwad

Senior Resident

ABSTRACT

The 2019 admission batch of MBBS students was introduced as New competency-based medical education undergraduate curriculum (CBMC). The curriculum was designed to create an "Indian Medical Graduate" (IMG) possessing the requisite knowledge, skills, attitudes, values and responsiveness, so that the graduate may function appropriately and effectively as a physician of first contact with the community while being globally relevant. Implementation of this curriculum is started across the country. Phase I of the curriculum includes anatomy, physiology, and biochemistry along with professional and personal development modules. Physiology has an enviable position in the medical curriculum as it explains the physiological and molecular basis of diseases. We present an appraisal of the curriculum in physiology by reviewing the components against Harden's six themes which are considered when planning or developing a curriculum.

The HARDENS six themes (SPICE Model) are-

The SPICES Model

S Student-centred -----Teacher-centred
P Problem-based ----- Information-gathering
I Integrated -----Discipline-based
C Community-based ----- Hospital-based
E Electives -----Standard Programme
S Systematic -----Apprenticeship-based

The model was originally developed to apply to an undergraduate medical curriculum, but can be adapted to a variety of settings. Further, five core components of CBME are selected on the basis of three research papers to characterize underlying assumptions of CBME to suggest ways of logical implementation for achieving the competencies expected of the Indian Medical Graduate. It help students to be equipped with competencies which they shall be able to use in their day-to-day work, which shall ultimately help benefit patient care and the society at large.

KEYWORDS

Competency based medical education, curriculum, physiology, undergraduate Indian Medical Graduate

INTRODUCTION

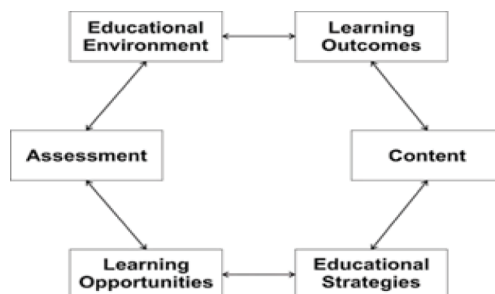
In India "traditional" undergraduate medical curriculum had remained discipline-based education, teacher centered, with a focus on knowledge acquisition and single time, summative assessments. The system depends on didactic lectures. Assessments were based on recall of factual information and honing of skills, especially in the subject of physiology.

Constituted by an act of Parliament, known as the National Medical Commission Act, 2019, the National Medical Commission (NMC), came into force by a gazette notification dated September 24, 2020. The NMC placed "Minimum requirements for annual MBBS admissions regulations, 2020," in the public domain on October 28, 2020.[1] The main aim of the NMC is to improve access to quality and affordable medical care; ensure the availability of adequate and high-quality medical professionals in all parts of the country.[2].

The goal of CBME is to produce an Indian Medical Graduate (IMG) who is envisaged as a doctor fulfilling the roles of clinician, leader, communicator, professional and lifelong learner.[3] physiology has an enviable position in the medical curriculum. physiology explains the physiological and molecular basis of diseases. A lot of medicine is based on physiology so the physiology teaching are advocated in the curriculum.[4] How the curriculum of physiology shall influence the achievement of the overall goals of the IMG curriculum at national and individual levels remains to be seen.

- *The role of physiology was clarified ---
- at phase 1- physiologist should refrain from expecting the students to diagnose disease, ability to do differential diagnosis. Integration is must for complexities of the disease with inputs from physiology should be pursued at the phase 3 levels.
- The important role in phase 1 is to know the normal and a clear cut early clinical exposure with no references to complex diseases.[5, 6-9]
- Dongre and Chacko have examined the new competency-based undergraduate curriculum document in community medicine using established frameworks and criteria to identify possible gaps in content and alignment.[10] The paper suggests that it can be used by other disciplines to work out the gaps. Therefore, we shall now review the components of the new curriculum against Harden's conceptualization of various components of the curriculum.[11].

Individual Components of Undergraduate Curriculum w.r.t. physiology



Harden suggested that the curriculum should contain the following components – learning outcomes, content, educational strategies, learning opportunities, assessment, and educational environment.[11] Curriculum development is a dynamic process. Any changes made in any of the components shall elicit changes in the other components as well

Learning Opportunities and Experiences

Considering the GMER -2018, out of 167 topics and 1118 outcomes for pre and para clinical subjects of MBBS, UG curriculum 6.6%(11) topics with 12% outcome applicable for the subject physiology. [12] Physiology competency involve mostly cognitive domain (K) with a level of knows how (KH) and skill(S) domain with level of show how (SH). Knowledge and skill blocks are foundation for understanding physiologic basis of disease in studies and in management

The teaching-learning strategies for physiology and implemented with the spirit keeping in mind the five roles of the IMG were modulated, ensuring that the modules developed have reference to them.[13] 1.clinician 2.Leader 3. Communicator 4.Lifelong 5.Learner and Professional

New curricular elements introduced, include the foundation course (FC), early clinical exposure (ECE), attitudes, ethics and communication (AETCOM), self-directed learning (SDL), elective postings (EP), skill training, clinical clerkships, the pandemic module and the family adoption program. Incorporation of structured

feedback, writing reflections and maintenance of logbooks are other notable features of the CBME.[1].

The foundation course, introduced in the first month of phase 1 is meant to familiarise the students with the teaching program, communication skills, time management, enhancement of language and computer skills, national programs, stress management, field visits, as well as sports and extracurricular activities. The three departments of Anatomy, Physiology and Biochemistry plan the related activities.

Early clinical exposure, rationally linking the theory of basic science to clinical practice, is a teaching and learning methodology that emphasizes the exposure of medical students to patients in classroom, hospital or community settings. In the classroom setting, patients can be brought to the classroom or paper cases can be discussed. In the hospital setting ward, clinic or laboratory visits are included. This is very important for the physiology department. A case can be discussed in the ward in small groups and the same batch of students can be taken for a ward and laboratory visit to showcase the different diseases and the laboratory reports. The community setting may include a primary health centre or community visits. Assessment is also ingrained in this module and humanities, ethics, and communication skills have to be intertwined in the case.

These are the modules that will be covered in the First MBBS as part of the AETCOM.

Module 1.1: What does it mean to be a doctor? No assessment is advocated.

Module 1.2: What does it mean to be a patient? Internal assessment—participation in group discussion. Final examination ---Short answer questions (SAQs) may be asked.

Module 1.3: The doctor-patient relationship. Internal assessment – critique of case discussions and final examination—SAQs on rights and responsibilities of patients, boundaries of the doctor-patient relationship.

Module 1.4: The foundations of communication – 1. Internal assessment—case discussion. No question in the final examination except for empathy etc. in applied questions.

Module 1.5: The cadaver as our first teacher. Internal assessment –active participation. No assessment in the final examination.

All the modules will be a part of the internal assessment and 1 question or sub-question could be asked in the final examination related to communication in Biochemistry i.e. modules 1.3 and 1.4. invariably, modules 1.1 and 1.2 are dealt with by Physiology, and 1.5 by Anatomy. Of course, this could differ with each college.

The AETCOM principles incorporated into the applied questions that are asked in theory added to the practicals with physiologic basis of the case and management of the diseases.

Two hours for the history of outbreaks, epidemics and pandemics, are dedicated to the pandemic module as part of the foundation course and are the responsibility of the pre-clinical phase. Five families, from areas not covered by the public health centre, shall be introduced to each student in Phase 1. Though Community Medicine will be involved, the pre-clinical phase shall incorporate into the timetable.

The electives module in basic sciences encourages students to participate in the basic sciences laboratory or join ongoing research programs. physiology departments with their rich material and programs available can play an important role. Applications to various scholarship funds can be made by the faculty.[14].

Assessment System

Assessment is without any doubt an essential element in every curriculum. There are two types of assessment practices advised in the CBC --- formative and summative. In the new CBME curriculum paradigm, the focus of assessment has shifted from summative assessment to formative assessment to facilitate the acquisition of stated outcomes. Assessment methods that rely on the ability of the students to recall like essays, short notes, MCQs should give way to the newer ways of using a combination of various types of questions e.g. structured essays (Long Answer Questions - LAQ), Short Answers Questions (SAQ) and objective type questions (e.g. Multiple Choice Questions - MCQ). Marks for each part should be indicated separately. MCQs if used, should not have more than 20% weightage. The phase 1

paper suggests that ECE assessment should be included subject wise, and this could be used as formative assessment. There should be at least one short question from AETCOM in each subject and one of the 3 tests in preclinical subjects should be prelim or pre-university examination.[15-17]

The competency-based undergraduate curriculum stresses objectivity, uniformity, validity and reliability of the assessment tools since assessment drives learning. Conventional Practical Examination (CPE) in physiology is subjective and associated with examiner variability and raises concerns over its validity and reliability. Objective Structured Practical Examination (OSPE) addresses this problem as it includes objective testing through direct observation, assessment of knowledge, comprehension and skills.

Clinical case studies and assessments devised related to them, help remind students that what they are learning has relevance in the real world, and may help motivate students to pay more attention to the numerous facts faced in biochemistry. [18, 19]

Traditional assessment methods of written theory and practical examinations should move into the setting of structured essays, deconstructed scenarios like OSCE or OSPE and workplace-based assessments (WPBA) such as the mini-CEX or direct observation procedural skills (DOPS) methods. Maintenance of logbooks which can be developed into portfolios, incorporating reflective thinking and narratives is advocated. Needless to say, the faculty have to be trained not only to conduct the new assessment methods but also to give feedback and mentor the learners. Direct observation of students with appropriate feedback strategies to help improve the utility of competency-based assessment, along with multiple assessors, multiple tools and multiple assessments to improve the validity and reliability of competency-based assessment have been suggested in the NMC module.

It is left to the departments to introduce the newer assessment methods. This leaves the system wanting to be dedicated, motivated stakeholders who understand the nuances of CBME and take it upon themselves to introduce, validate and evaluate the systems. Sharing best practices and collaboration with resource-rich and more experienced institutions to address faculty development is in line. This leads us to discuss Harden's sixth and final theme of the environment. [16, 20]

The foundation course which help to make the students work in collaboration - the sports activities, the discussions on the national programmes, communication skills, professionalism, ethics and clinical skills are the starting point in setting up the educational environment. That is why faculty attitude help in making this happen. This is coupled with the AETCOM and ECE modules. So, the onus lies with the 1 phase faculty and administration.

Learning experiences are effective to discover new things and learn from it. Skills which motivate the students to explore on new knowledge, trigger their curiosity and develop their critical thinking abilities in physiology curriculum. Early clinical exposure sessions and the practical aspects in physiology improve expected learning outcomes.

CONCLUSION

There is a variation in the ways that medical students learn the principles of physiology and relate them to medicine. . The aim is to sensitize the students at the pre-clinical phase about the optimal use of clinical and diagnostics and therapeutics.[32].

Physiology educators need to help the students to connect knowledge of the physiological studies, physiological basis and regulations etc. to clinical medicine. Finally, they should be able to explain these principles to their colleagues and their patients and be ready to accommodate new scientific discoveries into their approach to patient care. [22] The vertical integration of physiology in Phases 2 and 3 as per the suggestions of the NMC shall help to consolidate the knowledge, skills and attitude towards the subject.

The optimal implementation of the CBME curriculum with a dedication that shall influence the growth of our students to become successful Indian Medical Graduates will be the turning point in the history of Indian CBME implementation.

Suggestions for a Way Forward

The appraisal of the new NMC undergraduate curriculum in Physiology has shown that the curriculum makes an attempt to move toward integration of course content and defined the competencies in more measurable terms. The steps to be taken to help make the Physiology curriculum more robust by identifying and teaching to defined learning outcomes, devising stepwise approaches to skill development and the use of programmatic assessment.

CBME involves principles that are dynamic and there will be a constant necessity to evaluate, and evolve in such a way that all the stakeholders benefit from this entire exercise along with learners and the patients. The ultimate goal. CBME does not end with graduation from a training program, but should represent a career that includes ongoing assessment

REFERENCES:

1. National Medical Commission. Competency Based Under Graduate Curriculum. 2019. <https://www.nmc.org.in/information-desk/for-colleges/ug-curriculum/>. Accessed 01 Mar 2022.
2. National Medicine Commission. Minimum Requirements for Annual M.B.B.S Admissions Regulation. 2020. <https://www.nmc.org.in/rules-regulations/minimum-requirements-for-annual-m-b-b-s-admissions-regulation2020/>. Accessed 15 Jan 2022.
3. Medical Council of India. Competency based undergraduate curriculum for the Indian Medical Graduate. 2018. <https://www.nmc.org.in/wp-content/uploads/2020/01/UG-Curriculum-Vol-I.pdf>. Accessed 22 Feb 2022.
4. Rajashree R, Chandrashekar DM. Competency-based medical education in India: A work in progress. *Indian J Physiol Pharmacol*. 2020;64:7–9. doi: 10.25259/IJPP_264_2020. [CrossRef] [Google Scholar]
5. Danielson JA. Key assumptions underlying a competency-based approach to Medical Sciences Education, and their applicability to veterinary medical education. *Front Vet Sci*. 2021;8:688457. doi: 10.3389/fvets.2021.688457. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
6. Afshar M, Han Z. Teaching and learning medical biochemistry: Perspectives from a student and an educator. *Med Sci Educ*. 2014;24:339–41. doi: 10.1007/s40670-014-0004-7. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
7. Kanani D, Mishra A, Patel V, Patel A, Patel N. Learning medical biochemistry by combination of traditional & modern teaching methods: Students' perceptions. *Int J Clin Biochem Res*. 2020;7:259. doi: 10.18231/ijcbr.2020.005. [CrossRef] [Google Scholar]
8. Chaney KP, Hodgson JL. Using the five core components of competency-based medical education to support implementation of CBME. *Front Vet Sci*. 2021;8:689356. doi: 10.3389/fvets.2021.689356. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
9. Witharana C, Karunathilake I. A fascinating approach to learn biochemistry for medical student. 1st ed.; University of Colombo; 2021.
10. Dongre AR, Chacko TV. A critical review of new competency-based curriculum for community medicine using various curricular review frameworks. *Indian J Public Health*. 2019;63:362–6. doi: 10.4103/ijph.IJPH_141_19. [PubMed] [CrossRef] [Google Scholar]
11. Harden RM. Curriculum planning and development. In: Harden RM, Dent JA, editors. *A practical guide for Medical Teachers*. 4. London: Churchill Livingstone; 2013. [Google Scholar]
12. Pradip B Bardel, K K Deepak. Competency based physiology UG curriculum: Use of novel learning tools 64(suppl1);S19S20. doi: 10.25259/IJPP-277-200
13. Suneja S, Gangopadhyay S, Kaur C. Efforts to cope with CBME in COVID-19 era to teach biochemistry in medical college. *Biochem Mol Biol Educ*. 2020;48:6704. doi: 10.1002/bmb.21469. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
14. Medical Council Of India. Electives for the Undergraduate Medical Education Training Program. 2020. <https://www.nmc.org.in/wp-content/uploads/2020/08/Electives-Module-20-05-2020.pdf>. Accessed 24 Feb 2022.
15. Modi JN, Gupta P, Singh T. Competency-based medical education, entrustment and assessment. *Indian Pediatr*. 2015;52:413–20. doi: 10.1007/s13312-015-0647-5. [PubMed] [CrossRef] [Google Scholar]
16. Medical Council of India. Assessment Module for the Undergraduate Medical Education Training Program. 2019. https://www.nmc.org.in/wp-content/uploads/2020/08/Module-Competence-based_02.09.2019.pdf. Accessed 22 Feb 2022.
17. Jagadeesan AR, Neelakanta RR. Online self-assessment tool in biochemistry – A medical student's perception during COVID-19 pandemic. *J Educ Health Promot*. 2021;10:137. doi: 10.4103/jehp.jehp_792_20. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
18. McRae MP. Using clinical case studies to teach biochemistry in a doctoral program: A descriptive paper. *Creat Educ*. 2012;03:11736. doi: 10.4236/ce.2012.37174. [CrossRef] [Google Scholar]
19. Anees S, Harakuni S, Kausar R. OSPE in Biochemistry – A step towards implementation of competency based undergraduate curriculum. *Int J Clin Biochem Res*. 2021;8:2346. doi: 10.18231/ijcbr.2021.049. [CrossRef] [Google Scholar]
20. Lockyer J, Carraccio C, Chan MK, Hart D, Smee S, Touchie C, et al. Core principles of assessment in competency-based medical education. *Med Teach*. 2017;39:609. doi: 10.1080/0142159X.2017.1315082. [PubMed] [CrossRef] [Google Scholar]
21. Hutchinson L. Educational environment. *BMJ*. 2003;326:810–2. doi: 10.1136/bmj.326.7393.810. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
22. Fulton TB, Ronner P, Lindsley JE. Medical biochemistry in the era of competencies: Is it time for the Krebs cycle to go? *Med Sci Educ*. 2012;22:29–32. doi: 10.1007/Bf03341749. [CrossRef] [Google Scholar]