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Competency Based Medical Education

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Abstract

The aim of medical training is to train graduates to efficiently take care of the health and medical needs of the community. The present system is a subject-centric and time-bound method, with very little scope for feedback. Most of the evaluation is summative. The teaching-learning and evaluation methods focus more on knowledge but less on attitude and skills. Therefore medical graduates may have extraordinary knowledge but very little skills and attitude. They may also have deficiency in soft skills related to communication and doctors-patient relationship, ethics and professionalism. Competency Based Medical Education (CBME) is gaining worldwide momentum. The MCI has described the basic competencies required of an Indian Medical Graduate (IMG) and designed a competency based module on attitudes and communication. Acceptance of a competency based approach would result in a paradigm shift in the approach to medical education. Over the years a discernible gap between medical training, health care delivered and societal health needs is visible. Medical Schools are constantly facing the question "Are we producing graduates who are competent to cater to the health needs of the society". To attempt to correct this anomaly, it is befitting that we re-trace and work our way backwards by first defining the expected roles of physician and also clearly state the characters and abilities of medical professionals graduating from medical schools that enable them to perform these roles well [1,2]. The curricula then need to be altered such that these outcomes are steered by appropriate assessment methods. There lies the origin of CBME. The objective of medical training is to produce "doctor of first contact". The Indian Medical Education System has been revolving around the educational/learning objective of the traditional curriculum. The objectives encompass knowledge base with some references to procedural skills and behaviour to be developed during the course of training. In accordance with this, assessment methods also were traditionally designed to measure knowledge attained and specific skills rather than the ability of the graduate in delivering judicious and contextual health care in authentic settings. Efforts to make "competencies" as the chief driving force of training and curricular planning has gained momentum since the turn of the century [3].

Keywords: Competency; Medical education

Abbreviations: IMG: Indian Medical Graduate; CBME: Competency Based Medical Education; OBE: Outcome-Based Education; EPA: Entrustable Professional Activity

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Definitions

While "Competency" and "competence" are viewed interchangeably competencies may be viewed as ingredients of competence – many specific competencies together constitute the broader area of competence. In a particular area competence may encompass many aspects and hence is best expressed as a description (statement) of abilities in context of setting, experience and time (or stage of training) [4-6]. A widely used comprehensive definition by Epstein and Hundert states "the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values and reflection in daily practice for the benefit of the individual and community being served" [4]. Frank et al. [7] proposed as follows: "Competency based education is an approach to preparing physicians for practice that is fundamentally oriented to graduate outcome abilities and organized around competencies derived from an analysis of societal and patient needs. It de-emphasizes time based training and learner centeredness. Some experts believe that CBME is another form of outcome-based education (OBE) where learning outcomes assume more importance than learning pathways or processes.

Comparison with traditional curriculum

The three steps in planning CBME includes [5,6,7-11]

a. Identification of competencies.
b. Content identification and program organization.
c. Assessment planning and program evaluation.

Additionally faculty development and creating conducive environment are a must for effective delivery of the curriculum (Table 1).

	Steps for planning Competency-based Curriculum	Steps and strategies for implementation
1	Identification of competencies	a. Competency identification by consensus opinion of experts, health needs, analysis of physician activities, self-report by physicians to identify critical elements of behavior, critical incidents, public health statistics, medical records, practice setting and resources. b. Exactly define required competencies and their components. Bring out statement of learning outcomes and communicate to faculty and students.
2	Content identification & Program organization	a. Identify corresponding course content. b. Course organization: sequencing, learning opportunities, select educational activities, experience and instructional methods. c. Time organization: delineate minimum and maximum time period of training; Create space for feedback sessions and opportunity to reflect. d. Define the desired level of mastery/expertise in each area. e. Define milestones or achievement points along development path for competency i.e. charting of student progression pathway.
3	Assessment planning program evaluation	a. Identify observable and measurable form of competencies in real settings; e.g. EPA b. Define performance criteria: Establish minimum acceptable norms of summative performance and intervening levels of expertise. c. Select assessment tools to measure progress along the charted pathways i.e. formative assessment for achievement of milestones.

		d. Develop a longitudinal assessment program (rather than standalone formative and summative assessments), with emphasis on WPBA methods. Make a blueprint with areas to be assessed, timing and assessors. e. Design an outcomes evaluation program with scope for curricular review and improvement. f. Faculty development and student orientation. g. Ensuring conducive educational environment. h. Student selection: incorporate some mechanism for assessing aptitude and motivation towards pursuing medical studies and delivering health care.

Table 1: Steps of competency based curriculum planning and strategies for implementation (Modi et al.) [3].

Identification of competencies

A competence is the observable activity of a health professional, encompassing different components like knowledge, skills, values and attitudes. It is the application of competencies in an actual setting. An individual who does it is called competent. The core competencies required of a MBBS graduate are contextual to the environment and pre-determined in the curriculum. For instance six domains of general competency include patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism and system based practice which is ingrained by the American Council of Graduate Medical Education. In the UK three broad outcomes have been emphasized viz doctor as a scholar and a scientist, doctor as a practitioner and doctor as a researcher. The Canadian Medical Education Directors and Specialists include seven roles for a specialist including Medical Expert, Communication Manager, Health Advocate Scholar and Professional. The MCI has suggested that competency-based learning must include designing and implementing a curriculum that would focus on the desired and observable activity in real life situation. The competencies expected of an Indian Medical Graduate are listed in Table 2.

Competency	Description
Clinician	Who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.
Leader and member of a health care team and system	With capability to collect, analyse, synthesize and communicate health data appropriately.
Communicator	With patients, families, colleagues and community.
Lifelong learner	Committed to continuous improvement of knowledge and skills.
Professional	Who is committed to excellence in ethical, responsive and accountable to patient's community and profession?

Table 2: Competencies expected from Indian Medical Graduate (The Medical Council of India vision 2015).

Entrustable Professional Activity (EPA)

EPA bridges the gap between the theory and practice of CBME. While competencies are the abilities of a doctor, EPAs are descriptions of work that define a profession. The processes and outcomes of EPAs are observable and measurable. They require multiple competencies in an integrative holistic manner [12,13]. For example if we consider the management of tuberculosis at the primary level as the EPA, it will require a set of knowledge like clinical presentation of tuberculosis, investigations needed, interpretation of reports and attitude including communication with empathy, inviting questions and offering appropriate guidance and advice. The core competencies here would be those of a clinician, a communicator and a professional.

Milestones

Steps which the doctor goes through to achieve competency are called milestones. The Dreyfus model would have 5 such steps on milestones, these are: A novice, advanced beginner, competent, proficient and an expert. From the supervisors perspective these levels would progress to 5 levels: At first level, the student only observes the EPA. At levels 2 and 3 the student performs the EPA with direct, proactive supervision and with indirect supervision, respectively. At level 4, the student is ready for independent, unsupervised practice and is given the "Statement of awarded responsibility". The 5th level is when the student is ready to assist other learners in performing the EPA. CBME therefore includes core competencies or attributes required to excel in his/her profession. EPAs that together constitute the work role of a graduate in his/her practice and a logical trajectory of professional development in the form of milestones. Dhaliwal et al. [14] have explained an EPA activity training and evaluation of a pediatrics resident taking the example of managing a child with diarrhea (Table 3).

Dreyfus model	**Assessment of 'Competency' in CBME**		**Assessment of an 'Entrustable Professional Activity' (EPA)**
Developmental steps of skill acquisition as studied in various learning situations	Stepwise achievement of 'Milestones' towards acquisition of a competency.		Stepwise acquisition and integration of several competencies towards achieving Entrustable level of job responsibility (EPA).
	Example 1: Communication with patients (UG to PG years)	Example 2: Performance of Caesarian section (PG training in OBG)	Example: 'Care of the Neonate' as an EPA for PG training in Pediatrics (This EPA requires an integration of competency in patient care, procedural skills, communication & counseling skills, teamwork, managerial & leadership skills).

Novice	Able to talk with the patient so as to take basic medical history according to established framework. (At entry: II-III Semester MBBS student)	**Observers:** As second assistant during surgery	**Level 1:** Can be entrusted with examination of newborn to look for congenital anomalies.
Advanced beginner	Able to establish rapport with the patient and take a medical history for a diagnostic workup. Able to counsel the patient for health practices such as diet, hygiene. (Mid-level: IV – VII Sem MBBS)	**Assists:** As first assistant to a senior during surgery	**Level 2:** Can be entrusted to attend deliveries, receive and resuscitate term newborns in uncomplicated cases.
Competence	In addition to above: able to take histories of delicate personal issues and make a provisional diagnosis based on history. Able to counsel for taking informed consent for surgeries and procedures. (UG Exit level: VIII-IX Sem & Internship)	**Directly supervised:** Operates under supervision of a senior who scrubs and assists during the surgery.	**Level 3:** Can be entrusted with immunization and management of common problems in newborns in outpatient setting.
Proficiency	In addition to above: Able to counsel patient and care givers for a newly made diagnosis, diagnosis of serious illness and for seriously ill patients. (I-II Year PG students)	**Indirectly supervised:** The expert is available and supervises without actually scrubbing for surgery.	**Level 4:** Can be entrusted with receiving and resuscitation of the newborn in complicated cases such as preterm, growth restriction, large baby.
Expertise	In addition to above: Able to counsel Patient's care givers in the event of death of patient. (III Year PG student)	**Independent:** Without senior supervision	**Level 5:** Can be entrusted with management of common problems in the newborns in intensive care setting.

Table 3: Application of Dreyfus model to curriculum frameworks of Competency-Based Medical Education (Modi et al.) [3].

As CBME is learner centered, offering flexibility in time focusing on all the three domains, the teaching-learning activities would need a change in process and structure. Since CBME focuses on outcomes and prepares students for actual professional practice, teaching-learning activity would be more skill based involving more hands-on and clinical experience. Some examples of CBME include problem based learning in preclinical year and case based learning in clinical years with Clinico Pathologic Conferences, clinical audits and early clinical exposure. Skill training can be imparted through laboratory via practical sessions. Community based research and services can also be included. ICTC can be used to enhance learning [15].

One of the competencies expected of an IMG by MCI is "being a lifelong learner". Therefore students must be provided enough opportunities for self-directed learning. The teachers role would be to facilitate the students' progress. This would ensure lifelong learning.

Assessment in Competency-based Medical Education

Assessment should be robust and multifaceted since CBME promises greater accountability. The international collaborations for CBME include 6 key features for effective assessment in CBME.

a. Continuous and frequent – more formative assessment to guide the students' progress.
b. Criterion- based, using a development perspective. Thus a student will not be deemed competent, just because he is better than the rest, but only if and only when his performance matches a certain required standard of care.
c. Assessment has to be largely work-based. Direct observation and assessment of authentic clinical encounters will be essential.
d. Assessment tools must meet minimum standards of quality in terms of validity, reliability, acceptability, educational impact and cost effectiveness.
e. More qualitative approach to assessment must be incorporated. Judgment and feedback from experts are more meaningful than scores and grades.
f. Assessment should draw upon the wisdom of a group and the trainee should himself be actively involved in the assessment process. All this means multiple tools of assessment like work-place-based assessment, mini clinical evaluation exercise (Min CEX), direct observation, multi-source feedback and records of clinical work like log books and portfolios are needed. Formative assessment with feedback, largely work-based, would from backbone of CBME. Assessment in CBME should be frequent with qualitative feedback from teachers – Assessment need not always be objective. Subjective feedback from the teachers has been found to be reliable and provide more meaning and direction than numerical scores. Subjective judgments and feedback from experts have educational impact crucial for the success of CBME.

Implementation of CBME in the Institution

Implementation would begin with sensitization and training of faculty and curriculum planners. Subject experts would identify the EPAs pertaining to the health needs in their respective specialty and the core competencies required. By taking care to avoid duplication and inadvertent deletion of core competencies, experts design finer aspects of curriculum. They also ensure synchronization so that students are trained to develop the relevant competencies at the right time. Milestones to be achieved at the end of each year have to be decided. Ongoing feedback and continuous modification and revision of curriculum become important. In the Indian context CBME based curriculum planning includes 4 steps:

a. Identification of competencies
b. Content identification
c. Program organization
d. Assessment planning and program evaluation.

Curriculum map can be used as a tool to ensure that competencies, teaching-learning methods and assessment methods are constructively aligned.

Challenges in the implementation of CBME

Since CBME is a relatively new concept in India, sensitization and training of stakeholders and faculty would become necessary to enhance acceptance and ensure uniform implementation of CBME in all the medical colleges in the country. Understanding what CBME actually refers to, how it differs from EPA, where would milestones fit in, how to integrate "knowledge, skill, and attitude" therein, and what are the domains of competency as opposed to competencies will be a challenging task. Working out the logistics and implementation which includes procuring additional resources in terms of infrastructure, materials and work

force would be necessary. CBME de-emphasizes time bound training, but to manage a cohort of learners, wherein each promises to offer i.e. competent graduates, is one more challenge. These challenges explain the reluctance and apprehensions among teachers, learners and educational administrators about CBME. The impact of CBME in achieving this long term goal can only be evaluated in real terms when the IMG begins to practice his/her competencies in real life situations.

The future of CBME

The MCI has been insisting on moving on CBME as enunciated in its Vision 2015 document [16]. To maximize the benefits of CBME, a hybrid approach has been suggested wherein CBME should be in built in the tenets of the conventional curriculum in the initial phases of the change and the stakeholders would not be overwhelmed by a sudden change, while also providing an opportunity to measure and analyze the benefits of CBME. If the principles of CBME are implemented as per the regional context and circumstances, we may reap the harvest. Initial employment of a hybrid curriculum-part traditional and part CBME-would make the transition more acceptable.

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