REVIEW ARTICLE

Outcome-Based Learning: Advancing the Framework of Competency-Based Medical Education

Taruna Sharma[1], Deep Shikha[2], Megha[3], Ruchi Juyal[4]

Department of Pharmacology, Himalayan Institute of Medical Sciences, Swami Rama Himalayan University, Dehradun.
Department of Community Medicine, Himalayan Institute of Medical Sciences, Swami Rama Himalayan University, Dehradun
Department of Pharmacology, Himalayan Institute of Medical Sciences, Swami Rama Himalayan University, Dehradun
Department of Community Medicine, Himalayan Institute of Medical Sciences, Swami Rama Himalayan University, Dehradun

CORRESPONDING AUTHOR
Dr Deep Shikha, Professor, Department of Community Medicine, Himalayan Institute of Medical Sciences, Swami Rama Himalayan University, Dehradun
Email: drd.shikha@yahoo.co.in

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ABSTRACT

The implementation of Competency-Based Medical Education (CBME) in India by the National Medical Commission (NMC) in 2019 is a landmark change in the medical education scenario. This change in the medical curriculum from a time-bound model to an outcome-based model is an important move in ensuring that medical students are competent in facing the challenges of modern-day medicine. In this article, we attempt to critically examine the developments in the CBME model, which has been an evolving entity since 2019 and has seen recent developments in 2024. By emphasizing learner-centered and patient-centered learning strategies, CBME aspires to achieve the integration of theoretical knowledge with the practical skills and competencies required to provide effective medical practice. The curriculum development focuses on the holistic learning experience by incorporating the cognitive, psychomotor, and affective domains of learning to enable students to perform basic functions in the field of medicine and community health. It also promotes the culture of research and scholarly pursuit among the students. By examining the implementation strategies, feedback mechanisms, and performance outcomes of these curricula, the importance of these curricular changes can be clearly understood. The findings of this review emphasize the need to continuously improve and modify the curriculum to fulfill the needs of health care, leading to the achievement of the "Health for All" concept.

KEYWORDS

Competency-Based Medical Education (CBME), Outcome-Based Learning, Indian Medical Graduate, Curriculum revisions

INTRODUCTION

National Medical Commission (NMC) rolled over the Competency-Based Medical Education (CBME) curriculum in the year 2019, emphasizing learner-centric, patient-centric and outcome-oriented teaching learning.

The medical curriculum in India used to be a rigorous, time-based program with a strong emphasis on theoretical knowledge for many decades and was operating under the same regulatory framework. The need for skill-based, patient-centred training and worldwide trends in medical education led to the formal launch of the CBME curriculum in 2019, and since then it has been improved, revised and optimized in 2022, 2023 and again in 2024 (1,2).(3)

The goal of CBME is to produce Indian Medical Graduates who are capable of contributing to the realization of Health for All. They should possess the requisite skills required to prevent, diagnose, treat and rehabilitate individuals and communities. In addition, CBME aims to nurture a research-oriented mindset, encourage scientific temper, and provide opportunities for learners to acquire educational and scholarly competencies essential for lifelong learning and evidence-based medical practice (4–6)

This article critically reviews the revisions introduced from 2019 to 2024, exploring their significance for medical students, faculty, and the future trajectory of medical practice in India.

The 2019 Launch: Breaking from a 22-Year-Old Framework

The Graduate Medical Education Regulations (GMER) 2019 represented the first comprehensive overhaul of the MBBS curriculum since 1997, covering all domains of learning: cognitive, psychomotor, and affective to match Indian Medical Graduates with global standards. The CBME 2019 framework emphasized the acquisition of clinical skills as an indispensable component of medical education to ensure competent, patient-centred healthcare delivery (7,8).

Through collaborative teamwork, key stakeholders support, the CBME framework has been implemented across all over India. Further, it was strengthened

through support from nationwide training programs such as the Curriculum Implementation Support Program (CISP), capacity-building workshops, institutional facilities upgrades, and extensive learning resources. In line with GMER 2019, these initiatives paved the framework for efficient curriculum delivery along with effective curriculum governance (9,10).

The well-defined discipline-specific competencies aligned with program outcomes (POs) and course outcomes (COs) was an important breakthrough. The curriculum outlined tailored teaching-learning methodologies, assessment strategies, and integration approaches (both horizontal and vertical) to guarantee standardized and systematic implementation. The curriculum launched several structural innovations that had not existed in Indian undergraduate training before: Foundation Course, Family Adoption Program, Skill and Simulation based learning, formal Early Clinical Exposure, and Attitude, Ethics, and Communication (AETCOM). (1,2,5). While GMER 2019 laid a strong foundation for competency-based medical training, subsequent revisions between 2020 and 2024 sought to refine its implementation, address emerging challenges, and further strengthen outcome-oriented medical education in India.

Strengthening CBME: Insights from the 2023–2024 Revisions

The CBMER updates for 2023 and 2024 were a systematic response to insights gathered from five years of data and feedback from educators. As part of these ongoing reforms, the NMC launched the CBME Regulations 2023, which enhanced the focus on learner and patient-centered approaches. The updates were increasingly focused on outcomes, placed greater importance on critical thinking and research, and detailed the Program Outcomes (POs) and learning objectives more clearly.

CBMER 2024: Precision and Accountability

The 2024 update demonstrated a level of granularity that signalled institutional maturity. Rather than broad policy statements, this revision delivered operational specificity:

Subsequently, the CBME Regulations 2024 were released with important updates:(7,11)

- Revision of competencies across all three volumes (I, II, and III)
- Updated teaching-learning hours and course outcomes
- Clear guidelines on internal assessments for core and allied specialties
- Introduction of remedial strategies and a structured mentorship program
- Phase-wise assignment of AETCOM modules with suggested blueprinting
- Strengthened alignment and integration of horizontal and vertical learning components

A key highlight is the introduction of six integrated modules on diseases of public health importance in India, Anemia, Tuberculosis, Ischemic Heart Disease, Diabetes, Hypertension, and Thyroid disorders to be implemented across the MBBS program. Institutions are given autonomy to schedule these phase-wise (12,13).

AETCOM: The implementation of the AETCOM module has evolved from a novel introduction in 2019 into a highly structured, phase-wise journey designed to produce Indian medical graduates into empathetic and ethical professionals keeping the program outcome of professional ethics in mind and patient centred care. While the initial 2019 regulations laid the groundwork, introduced the module, the 2024 updates have further refined this by introducing phase-wise module distribution & suggested blueprinting to ensure its effective integration into the clinical training.

The overarching goal of these changes is to ensure that by the time a student becomes an Indian Medical Graduate (IMG), they possess the humanistic values required to deliver compassionate care. By shifting hours toward the final phases (Phase III Part II), the curriculum ensures that ethical training is most intensive when students are most active in patient care.

Competency Mapping and Curriculum Delivery

The 2024 reforms emphasize mapping competencies with course outcomes. Institutions are expected to develop:

- PO and CO mapping
- Competency-wise learning objectives
- Aligned teaching-learning methods
- Formative and Summative assessments

Careful planning of logistics, time, certification processes, and integration methods is essential for successful delivery of the CBME curriculum.

Teaching and Assessment Reforms

The clinical postings were rescheduled to better align with teaching-learning of both core and allied subjects. Internal and formative assessments were further streamlined to align with curriculum objectives. Summative assessments were redesigned to include (Table1-6):

- Revised theory paper structure for allied subjects
- Reintroduction of ENT and Ophthalmology into Phase III Part I
- Detailed Phase wise internal assessment marks distribution for core and allied specialities
- Detailed Phase wise summative assessment marks distribution for core and allied specialities
- Eligibility criteria for examiners were modified, reducing the required experience from four to three years.

Table 1: Comparative distribution of teaching learning hours in phase-1 curriculum

Phase	Subject Name	UGMEB 2022				CBMER 2023				CBMER 2024			
		Hours				Hours				Hours			
		L	SGT	SDL	Total	L	SGT	SDL	Total	L	SGT	SDL	Total
Phase 1	Foundation Course	-	-	-	39	-	-	-	160	-	-	-	80
	Human Anatomy	220	410	20	650	210	400	10	620	180	430	10	620
	Physiology	138	308	15	461	130	300	10	440	130	305	10	445
	Biochemistry	80	150	15	245	78	144	10	232	82	157	10	249
	Early clinical exposure	60	-	-	60	27	-	-	27	-	27	-	27
	Community medicine	20	20	-	40	20	20	-	40	20	20	-	40
	Family Adoption Program	-	27	-	27	-	-	27	27	-	24	-	24
	AETCOM	-	26		26	-	26	-	26	-	26	-	26
	Sports and extra curricular activities	-	-	-	10	-	-	-	10	-	-	-	10
	Formative and Term Assessment	-	-	-	80	-	-	-	60	-	-	-	-
	Total	**518**	**941**	**50**	**1638**	**464**	**918**	**30**	**1521**	**412**	**989**	**30**	**1521**

Table 2: Comparative distribution of teaching learning hours in phase-II curriculum

Phase	Subject Name	UGMEB 2022					CBMER 2023					CBMER 2024				
		Hours/Periods/Credits					Hours/Periods/Credits					Hours/Periods/Credits				
		L	SGT	Clinical Postings	SDL	Total	L	SGT	Clinical Postings	SDL	Total	L	SGT	Clinical Postings	SDL	Total
Phase 2	Pathology	80	158	-	17	255	80	165	-	10	255	80	170	-	10	260
	Pharmacology	80	158	-	17	255	80	165	-	10	255	80	170	-	10	260
	Microbiology	70	140	-	10	220	70	135	-	10	215	75	143	-	10	228
	Community medicine	20	23	-	10	53	15	-	-	10	25	25	-	-	10	35
	Family Adoption Program	-	-	27	-	27	-	-	30	-	30	-	-	24	-	24
	Forensic Medicine and Toxicology	15	28	-	5	48	12	22	-	8	42	12	25	-	8	45
	Clinical Subjects	75	-	585	-	660	59	-	540	-	599	60	-	540	-	600
	AETCOM	-	29	-	8	37	-	29	-	8	37	-	29	-	8	37
	Sports and extra curricular activities	-	-	-	20	20	-	-	-	20	35	-	-	-	32	32
	Pandemic Module					28	-	-	-	28	28	-	-	-	-	-
	Total	**340**	**536**	**612**	**87**	**1638 (including surplus 35 hours)**	**316**	**516**	**585**	**104**	**1521**	**332**	**537**	**564**	**88**	**1521**

Table 3: Comparative distribution of teaching learning hours in phase-3 part-1 curriculum

Phase	Subject Name	GMER 2019				CBMER 2023				CBMER 2024			
		Hours/Periods/Credits				Hours/Periods/Credits				Hours/Periods/Credits			
		L	SGT	SDL	Total	L	SGT	SDL	Total	L	SGT	SDL	Total
Phase 3	General Medicine	25	35	5	65	30	50	10	90	20	30	10	60
	General Surgery	25	35	5	65	30	50	10	90	20	30	10	60

Phase	Subject Name	GMER 2019 Hours/Periods/Credits				CBMER 2023 Hours/Periods/Credits				CBMER 2024 Hours/Periods/Credits			
		L	SGT	SDL	Total	L	SGT	SDL	Total	L	SGT	SDL	Total
Part I	Obs & Gyn	25	35	5	65	30	50	10	90	20	30	10	60
	Pediatrics	20	30	5	55	25	30	10	65	-	-	-	-
	Ortho + PMR	15	20	5	40	15	20	10	45	-	-	-	-
	Forensic Medicine & Toxicology	25	45	5	75	40	70	20	130	35	65	20	120
	Community Medicine	40	60	5	105	55	70	20	145	50	80	20	150
	FAP	-	27	-	27	-	21	10	31	-	26	10	36
	Otorhinolaryngology	15	21	5	41	15	20	10	45	30	50	20	100
	Ophthalmology	20	20	3	43	15	20	10	45	30	50	20	100
	Clinical Postings	-	-	-	600	-	-	540	540	-	-	-	648
	AETCOM	-	19	6	25	-	19	12	31	-	19	12	31
	Pandemic module	12	-	-	12	18	-	-	18	-	-	-	-
	Total	222	347	49	1365 (Including surplus 69)	273	546	672	1521	205	536	132	1521

Table 4: Comparative distribution of teaching learning hours in phase-3 part-2 curriculum

Phase	Subject Name	UGMEB 2022 Hours/Periods/Credits				CBMER 2023 Hours/Periods/Credits				CBMER 2024 Hours/Periods/Credits			
		L	SGT	SDL	Total	L	SGT	SDL	Total	L	SGT	SDL	Total
Phase 3	**Electives**	-	-	-	78	-	156	-	156	-	-	-	-
Part II	**General Medicine**	70	125	15	210	80	140	40	260	110	185	40	335
	General Surgery	70	125	15	210	80	140	40	260	90	153	30	273
	Obs & Gyn	70	125	15	210	80	140	40	260	80	150	30	260
	Pediatrics	20	35	10	65	30	60	30	120	50	70	30	150
	Ortho + PMR	20	25	5	50	25	35	25	85	30	50	20	100
	AETCOM	28	-	16	44	30	-	22	52	30	0	22	52
	Dermatology	20	5	5	30	15	10	15	40	13	17	10	40
	Psychiatry	25	10	5	40	15	15	15	45	13	17	10	40
	Respiratory Medicine	10	8	2	20	15	15	15	45	-	-	-	-
	Otorhinolaryngology	10	26	5	41	15	15	15	45	-	-	-	-
	Ophthalmology	10	28	5	43	15	15	15	45	-	-	-	-
	Radiodiagnosis & Radiotherapy	10	8	2	20	8	15	15	38	8	10	8	26
	Anaesthesiology	8	10	2	20	8	15	15	38	8	10	8	26
	Clinical Postings	-	-	-	792	-	-	-	-	-	-	-	1116
	Pandemic module	28	-	-	28	28	-	-	28	-	-	-	-
	Total	**399**	**530**	**102**	**2223 (including 319)**	**444**	**610**	**302**	**1356**	**432**	**662**	**208**	**2418**

Table 5- Comparative distribution of clinical posting schedule in weeks

Subjects	UGMEB 2022				CBMER 2023				CBMER 2024			
	Period of Training in Weeks			Total	Period of Training in Weeks			Total	Period of Training in Weeks			Total
	II MBBS	III MBBS Part I	III MBBS part II	weeks	II MBBS	III MBBS Part I	III MBBS part II	weeks	II MBBS	III MBBS Part I	III MBBS part II	weeks
Electives		2	2	4	0	4	0	4	00	0	4	4
General Medicine	8	4	8	20	9	4	14	27	8	4	12	24
General Surgery	8	4	8	20	7	4	10	21	6	6	12	24
Obs & Gynae	8	4	8	20	7	4	10	21	6	4	12	22
Pediatrics	4	4	4	12	4	4	5	13	4	2	6	12
Community Medicine	4	4	0	8	4	4	0	8	4	4	0	8
Orthopaedics	2	2	4	8	2	2	4	8	0	2	6	8
Otorhinolaryngology	0	4	4	8	0	3	4	7	4	4	0	8
Ophthalmology	0	4	4	8	0	3	4	7	4	4	0	8
Respiratory Medicine	0	2	2	4	0	0	0	0	0	0	0	0
Psychiatry	1	1	2	4	0	2	4	6	0	2	4	6
Radio-diagnosis	0	1	1	2	0	0	2	2	0	0	2	2
Dermatology	2	2	2	6	2	2	2	6	0	0	6	6
Dentistry	2	0	0	2	0	0	0	0	0	0	0	0
Anaesthesiology	0	2	2	4	0	0	3	3	0	0	2	2
Casuality	0	0	2	2	0	0	0	0	0	0	0	0
Total	**39**	**40**	**53**	**132**	36	36	62	134	36	32	66	134

Table 6: Comparative marks distribution of formative and summative assessment

Subjects		UGMEB 2022		CBMER 2023		CBMER 2024		
		Theory	Practical	Theory	Practical	Theory		Practical
Formative assessment								
Anatomy, Physiology, Biochemistry, Pathology, Pharmacology, Microbiology		100	100	500	500	100		100
Forensic Medicine*	**Phase II**	-	-	375	500	25	100	100
	Phase III part I	100	100			75		
Community Medicine*	**Phase I**	-	-	500	500	25	100	100
	Phase II	-	-			25		
	Phase III part I	100	100			50		
Ophthalmology*	**Phase II**	100	100	375	500	25	100	100
	Phase III part I					75		
Otorhinolaryngology*	**Phase II**	100	100	375	500	25	100	100

		Phase III part I					75		
Medicine and Allied*	**Phase II**		200	200	500	650	50	200	200
	Phase III Part 1						50		
	Phase III part II	**Medicine**					75		
		Psychiatry					13		
		Dermatology					12		
Surgery and Allied*	**Phase II**		200	200	500	650	25	200	200
	Phase III Part 1						25		
	Phase III part II	**General Surgery**					75		
		Orthopaedics					50		
		Anaesthesia					13		
		Radiodiagnosis					12		
Obstetrics Gynaecology			200	200	500	650	200		200
Pediatrics			100	100	375	500	100		100
Eligibility criteria for appearing for University Examinations					Internal Assessment: 50%combined in theory and practical (not less than 40% in each)				
*Phase wise division in first column is applicable for CBMER 2024.									
Summative assessment									
Phase-I			200	100	200	100	200		100
Anatomy, Physiology, Biochemistry									
Phase II			200	100	200	100	200		100
Pathology, Pharmacology, Microbiology									
Phase III Part I									
Forensic Medicine & Toxicology,			100	100	100	50	100		100
Community Medicine			200	100	200	100	200		100
Ophthalmology#			100	100	100	100	100		100
Otorhinolaryngology#			100	100	100	100	100		100
Phase III Part II									
General Medicine*, General Surgery, Obstetrics Gynaecology (2 papers for each)**			200	100	200	100	200		100
Pediatrics			100	100	100	100	100		100
Passing Criteria			Mandatory 50% marks in theory and practical each. In subjects that have two papers, the learner must secure at least 40% marks in each of the papers.		Mandatory to get 40% marks separately in theory and in practicals; and totally 50% marks in theory and practical. In subjects that have two papers, the learner must secure at least 40% marks aggregate (both theory papers together).				

For Batch 2022 and 2023 following marks distribution must be followed:

**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; **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; For Batch 2024 following marks distribution must be followed: * Paper 2 must include medicine 50%, Psychiatry 25%, Dermatology 25%; ** Paper 2 must include General Surgery 40%, Orthopaedics 40%, Anaesthesia 10%, Radio-diagnosis 10%; # Summative exam for Ophthalmology and Otorhinolaryngology in phase III part II for 2022 batch; MBBS phase III Part II shall be replaced by NExT Step I and NExT Step II after approval of NExT regulations.*

Conclusion

The evolution of the Competency-Based MBBS curriculum represents a paradigm shift from conventional time-based learning to competency and outcome-oriented medical training. Emphasis is on learner-centric teaching, skill acquisition, measurable outcome, holistic development with the aim to produce clinically competent and ethically sound IMG. Although challenges in implementation exist but with sustained commitment of educator, key stake holder CBME holds the potential to transform medical training in India. Looking ahead medical education will further evolve with greater integration of emerging technologies.

Integrating modern technological advancements like Advance simulation techniques including augmented reality (AR) & virtual reality (VR) techniques into education and training will foster compassionate, ethical, and resilient healthcare professionals for the future, ultimately providing exceptional patient care grounded in both scientific integrity and humanistic principles.

Authors Contribution

All authors have contributed equally.

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Conflict of Interest

There are no conflicts of interest.

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The authors haven't used any generative AI/AI assisted technologies in the writing process.

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