Education Section

Challenges in Implementing Competency-based Medical Education Curriculum in Pharmacology: An Indian Perspective

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Dear Sir,

Competency-Based Medical Education (CBME) represents a shift from the traditional medical training to an outcome-oriented approach [1]. The CBME curriculum was introduced in 2019 and revised in 2024, but there still seems to be a lag in the form of curriculum design and limited time. Hence, there is a need for a curriculum re-review and support for active learning. CBME emphasises that learners should achieve specific competencies (skills, knowledge and attitudes), active learning formats such as Self-Directed Learning (SDL), Small-Group Discussions (SGD), Demonstration-Observation-Assistance-Performance (DOAP), which can improve learners' skills and confidence. The idea of CBME is good and is highly praised, but the ground reality is that there is a lag between the curriculum and its implementation [2-4]. There are some competencies that demand a detailed understanding, but they are clubbed into a single competency. For example, competency pH 8.3, which is mentioned as, "Explain the kinetics, dynamics, adverse effects, indications of the following antibacterial drugs: sulphonamides, quinolones, beta-lactams, macrolides, tetracyclines, aminoglycosides, and newer antibacterial drugs" [5]. This single competency is a combination of seven topics from antimicrobials. The concepts and clinical applications of beta-lactam antibiotics are extensive. To elaborate, beta-lactam antibiotics include penicillins, β-lactamase inhibitors, cephalosporins etc. This constitutes a vast and complex topic that is difficult to cover in a single class. Given their vast clinical importance, identifying important adverse events, major clinical indications and the rationale of antibiotic selection requires a clear and comprehensive understanding. To support understanding of this topic, it should be divided into various subsections and the time allotted should be redistributed.

While we address this gap, how time is distributed across major systems so that essential competencies receive adequate coverage should also be revisited. The competencies for the autonomic and peripheral nervous system and autacoids (pH 2.1-2.8) are currently allotted one month [5]. The Autonomic Nervous System (ANS) includes cholinergic and adrenergic drugs, while the Peripheral Nervous System (PNS) section covers skeletal muscle relaxants and local anaesthetics. Furthermore, autacoids include anti-rheumatoid drugs, anti-gout drugs, and non-steroidal anti-inflammatory drugs. These topics are extensive and clinically complex. Given their frequent use in clinical practice and their potential for serious adverse drug reactions and complex drug interactions, allocating more than one month would allow for better conceptual understanding and safe prescribing principles.

On the other hand, the gastrointestinal system module includes peptic ulcer disease, gastroesophageal reflux disease, antiemetics, and drugs used in diarrhoea and constipation (pH 6.1-6.5) [5]. These topics are comparatively concise, straightforward, with limited drug classes and well-defined mechanisms of action. Therefore, these topics can be adequately covered and assessed within a period shorter than one month, allowing redistribution of time to more complex and extensive systems like the ones mentioned above. The curriculum committee at the institutional level has also acknowledged that in the revised CBME 2024, some of the competencies have been allotted less time frame proportionately (pH 8.1 to 8.11), whereas GIT was allotted more time (pH 6.1-6.5). The curriculum committee at the institutional level has agreed that the discrepancy exists with some competencies in CBME 2024.

The remaining systems, including the cardiovascular, renal, and endocrine systems, do not require any modification. The current competencies and time allocation for these systems are adequate. These competencies are prescribed by the National Medical Commission (NMC) and are uniformly implemented across medical institutions nationwide.

Overall, CBME has a strong framework for pharmacology. However, for the complete success of CBME in pharmacology, there needs to be robust implementation of trained in-house faculty. The faculty should be trained in outcome-based teaching, feedback methods, and active learning strategies such as case-based learning. These trainings should be provided through NMC-mandated Faculty Development Programs, CBME workshops by Medical Education Units (MEU) within the Institute. Furthermore, standard textbooks with competency-based chapters for better understanding, and a certain time allocation to various competencies that need to be addressed. The international CBME comparison to the current NMC curriculum is as follows [Table/Fig-1] [6-8].

Aspect	India (NMC- CBME)	United Kingdom (GMC)	United States (AAMC/ACGME)
Curriculum framework	Competency-based, with defined subject-wise competencies	Outcome-based, integrated and system-based	EPA-based competency framework
Pharmacology focus	Rationale for drug use, essential medicines, Adverse Drug Reactions (ADRs)	Safe prescribing, clinical pharmacology	Safe prescribing embedded in EPAs
Teaching approach	Mix of lectures, Self-Directed Learning (SDL) and early clinical exposure	Integrated, case-based, spiral learning	Longitudinal, problem-based learning
Clinical integration	Limited but improving	Strong and early integration	Strong longitudinal integration

[Table/Fig-1]: International CBME and the Indian NMC curriculum.

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AUTHOR DECLARATION:
• Financial or Other Competing Interests: None
• Was informed consent obtained from the subjects involved in the study?   NA
• For any images presented appropriate consent has been obtained from the subjects.   NA