EDITORIAL

Outcomes are what matter: Competency-based medical education gets us to our goal [version 1]

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Abstract
This article was migrated. The article was marked as recommended.

Health professions education is undergoing a major paradigm shift to competency-based medical education. When shifts in thinking are profound and result in transformations of existing paradigms, there is often an accompanying criticism. While competency-based medical education is an evidence guided change in approach to curriculum and assessment, it is not immune to critique and concerns. Some criticisms are valid, and must be addressed as competency-based medical education is implemented; other concerns raised about competency-based medical education highlight the importance of clarity in language and purpose when discussing new paradigms. In this commentary, we aim to offer a balanced view of competency-based medical education by presenting an overview of the origins and conceptual assumptions of competency-based medical education and acknowledging valid criticisms of the approach.

Keywords
competency based medical education
Commentary
Competency-based medical education (CBME) is now entrenched in medical education across Canada, the United States, and parts of Europe and the United Kingdom. Inevitably, this profound and widespread shift in educational approach is accompanied by criticisms of CBME - including questioning the need for change, danger of reductionism, and lack of evidence for CBME. However, in light of rising concern over preventable medical errors, it is difficult to refute that existing time-based medical education models are falling behind in preparing graduates for increasingly complex systems of patient care. CBME is an evidence-guided alternative to an outdated educational approach that must be changed.

Healthcare systems and patient care needs are changing dramatically. The goal of CBME is to create physicians who are able to meet those needs, and improve patient care. In order to provide optimal care, physicians must be increasingly competent in skills such as communication, professionalism, teamwork, and patient-centred care; skills that go well beyond the traditional emphasis on attaining and applying knowledge. By focusing on learner outcomes and the competencies required for practice, CBME is well positioned to prepare physicians for this brave new world of healthcare.

The CBME framework requires fundamentally changing our approach to medical education (Table 1). The central premise of CBME is that the competencies required for optimal patient care outcomes are clearly defined and guide the design of all curricular elements. CBME therefore requires substantial redefinition of assessment practices as well as faculty and learner roles, responsibilities, and relationships. Indeed, in CBME, each learner is viewed as having an individual developmental path with unique strengths and areas for improvement. CBME is therefore not a tweak to the system; it is a holistic, transformative change in how we prepare physicians for practice. CBME focuses on outcomes: “What can our trainees do?”, rather than “Did our trainees complete the curriculum?” The focus on the outcome of demonstrated learner competence in workplace settings achieves the critical connection between CBME and patient care needs.

The transformational aspect of CBME poses challenges for many. For example, critics assert that CBME is too reductionistic, and that various competency frameworks like CanMEDS and the ACGME competencies parse “being a good doctor” into individual checklists that discount the whole. This valid criticism represents a risk in CBME implementation that must be monitored, lest CBME devolve into an ineffectual list of tick boxes. CBME is about creating clarity in outcomes, but not while losing sight of the learner as a developing healthcare professional. CBME requires looking at medical education similarly to how we approach caring for a complex patient with multiple co-morbidities.

| Table 1. Competency-based medical education is a fundamentally different approach than traditional medical education |
|---------------------------------------------------------------|
| **Competency-based medical education** | **Time-based medical education** |
| Emphasis is on what the trainee does | Emphasis is on what the trainee knows |
| CBME is an evidence-guided intervention, drawing from multiple theories and approaches within and beyond medical education (e.g., mastery learning, programmatic assessment, assessment for learning) to achieve pre-defined learning outcomes | Traditional medical education addresses what is taught, including when and for how much time |
| Relationship between the trainee and teachers is one of coaching towards competence | Relationship between trainee and teachers is primarily unidirectional, with teachers imparting knowledge/skills (teaching) or judging (assessing) the trainee |
| Learning experiences are guided by individual progress towards competence | Learning experiences are defined by fixed curricula with specific allotments of time |
| Reflection on learning, self-monitoring, and self-regulated learning are explicitly expected, and are supported by the faculty coach | Learners are recipients of teaching and have limited choice in what they learn, when they learn it, or in directing their own learning |
| Learning is individualized to the greatest degree possible, allowing learners to focus on enhancing learning in self-selected areas once competence is demonstrated, or adding time if needed to demonstrate competence | Learning is assumed to be “one size fits all”, with limited flexibility to meet individual needs |
| Reflection and self-monitoring carry on into continuing professional development | Continuing professional development is not seen as a continuation of the learning during training |
While we need to look at each element and treat them individually, the whole person remains a priority at every stage of management.

Ironically the word “competence” itself is a target of criticism: “we should train for excellence, not mere competence or minimally acceptable performance”. Rather than lowering the bar, the intent of CBME is to promote “cumulative learning along a continuum of increasing medical sophistication.” As an evidence-guided practice, CBME draws substantially from mastery learning and also incorporates existing, evidence-based educational theories and approaches from across the educational continuum within and beyond medical education. Furthermore, as is consistent with advanced studies on promoting optimal learning, CBME stresses direct observation - educators must watch trainees with patients and colleagues to ensure demonstration of competence. The faculty role evolves from transmitter of information to observer, coach, and guide. Again, as is consistent with our evolving understanding of building capacity for life-long learning, trainees are challenged to take responsibility to direct and enhance their own learning. Ultimately, competence at graduation is not the end point, it is the starting point for a lifetime of learning which builds on that attained and demonstrated competence. CBME continues into practice, as a fundamental part of continuously learning and improving as a physician.

“Where is the evidence for CBME?” - critics ask with heightening urgency. This relevant question reflects the reality that most CBME work to date has focused on applying core theories of learning into practice, rather than creating evidence of validity. Early research is beginning to show that greater amounts of feedback and direct observation, both inherent aspects of CBME, improve the capacity of the program to respond to individual learning needs, including the early detection of residents in difficulty. Going forward however, it is important to acknowledge the need to accumulate evidence regarding the impact of CBME. It is naïve however, to assume that one study can definitively prove the value of CBME. CBME is a complex intervention with multiple components, and creating evidence that CBME ‘works’ will require systematic accumulation of data - what works for whom under which circumstances and why. The challenge is to focus on understanding the implementation chain - how the various CBME inputs and activities contribute to intended and unintended outcomes. This chain mimics clinical research, where accumulation of evidence progresses from theory and observation to small, short term single institution interventions to larger rigorous multi-institutional studies, over time supporting evidence-informed guidelines and consensus.

Not all educators are convinced that CBME is needed, or worth pursuing. To some, CBME is seen as trendy or simply an intellectual exercise, similar to other past educational innovations (e.g., portfolios, problem-based learning), where a good concept did not always live up to its promise. To others, CBME appears to be yet another “make-work project”, similar to adding learning objectives to curricula- an arduous task that generated a lot of work, but produced little real change.

Unlike these targeted innovations, however, we have argued that CBME calls for transformative curricular change. We have also identified an urgent need to build the necessary base of evidence in order to fully understand the impact of CBME. For although CBME embodies significant advances in educational practice, we must remain aware that our focus on competencies is not about ticking off checklists but about creating physicians who are able to meet rapidly evolving societal needs. Accordingly, as a group involved in frontline education, program leadership, and research, we welcome ongoing dialogue.

Notes On Contributors
Shelley Ross, PhD is an Associate Professor at the University of Alberta.

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The International Competency Based Medical Education Collaborators are a group of health professions education experts who examine conceptual issues and current debates in CBME. A list of the ICBME Collaborators can be found at http://www.royalcollege.ca/rcsite/educational-initiatives/icbme/icbme-collaborators-e

Declarations
The author has declared that there are no conflicts of interest.
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**Version 1**

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**Sateesh Babu Arja**
Avalon University School of Medicine

This review has been migrated. The reviewer awarded 4 stars out of 5

It is a very well written paper and it is an important topic these days in medical education. Even in the ICME-Ottawa conference 2018 in Abu Dhabi, there was a great deal of discussion about competency-based medical education. The more emphasis was given for the competencies, skills, communication, and professionalism. I also heard the quote "Medical graduates are expected to be fit to practice rather than to be fit to pass only assessments or examinations". The other comment is knowledge is cheap and it available everywhere on the internet. Lot of medical schools is shifting towards the competency-based medical education. But we need to question ourselves as educationalists, what went wrong with current medical education or curriculums as mentioned by professor Puthiaparampil? Are we not preparing the competent enough physicians? I would like to see more of these details. I have also seen in some other conferences regarding artificial intelligence and/or robots taking over examination skills and/or diagnosis and left over is only communication and professionalism to the medical profession and physicians. If this medical profession left only with communication and professionalism, is current medical education preparing the graduates competent enough in communication skills and professionalism? Or do us really need competency-based medical education. I would like to see all these to be answered before us judging competency-based medical education and current medical education. I would like to add one more comment that when we are making a change, we need to acknowledge the merits in the current system. Even though there is less importance for didactic lectures and imparting knowledge in the current days, I believe that lectures provide the scaffold that learners need to learn.

**Competing Interests:** No conflicts of interest were disclosed.
Michael SH Wan
University of Notre Dame

This review has been migrated. The reviewer awarded 4 stars out of 5

A well written review of the CBME with good comparison of the 'classical' vs 'new competency' approach to teaching. The 'does' level is difficult to assess objectively compared to the 'classical' testing of the 'knows'. The trend for patient-centered care, clinical competency and EPAs with the rapid evolution of programmatic assessment will need good evidence based support. The limited time for the medical program with the ever expanding knowledge required for the support to become a all-rounded physician is always a challenge to the curriculum developer and assessors.

Competing Interests: No conflicts of interest were disclosed.

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Thomas Puthiaparampil
UNIVERSITI MALAYSIA SARAWAK

This review has been migrated. The reviewer awarded 4 stars out of 5

Well written article. Surely all medical schools aim to produce efficient medical doctors. In some parts of the world it is called Outcome-Based Medical Education. I believe CBME and OBME refer to the same ideal. I would have liked to see also a detailed description of what is wrong with the current system (I am not sure what it is called). Has the current system failed so badly? Have the current doctors not performing satisfactorily? I believe all medical schools test the candidate multiple times to assess their competency in clerking real patients to reach a diagnosis, produce a plan of investigation and treatment. I can see the downside of time-based curriculum (fixing the number of years the candidate can take), which will compel the candidate either to pass the examination or leave the course. It will be excellent, if personal mentoring is given to all candidates. But how far it is practicable? I do not believe that a candidate who graduates from a medical school is already competent to practice without supervision. The 2-year houseman ship practiced in Malaysia is the time the new graduates really get the opportunity
to put into practice what he learned in the medical school. One cannot ignore the strong foundation in knowledge and clinical skills which enable the doctor to perform his job efficiently. Communication skills, professionalism, team work etc. will surely follow during the 2 year houseman ship period.

**Competing Interests:** No conflicts of interest were disclosed.

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Alan Jaap
University of Edinburgh Medical School

This review has been migrated. The reviewer awarded 4 stars out of 5

A really thought-provoking commentary on the current state of play for CBME. It would have been useful to expand the discussion to consider outcomes in more detail: while few would disagree that individual competencies are important, some appear too nebulous to assess unless packaged in a meaningful outcome - like an authentic clinical task. This is why the concept of entrustable clinical activities is so intuitive and appealing. A second practical aspect of CBME that warrants further consideration is the ‘time versus competency’ dilemma - i.e. how do you truly ensure competency-based progression within rigidly time-defined undergraduate courses or postgraduate training programmes? It is possible to envisage faster-track and slower-track streams with more or less elective components for those who achieve desired competencies earlier or later than average, although this would pose significant administrative challenges. Like the authors, I look forward to more publications addressing the practicalities of CBME.

**Competing Interests:** No conflicts of interest were disclosed.

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Davinder Sandhu
Royal College of Surgeons in Ireland, Medical University of Bahrain, POBox 15503, Adliya, Bahrain.
This review has been migrated. The reviewer awarded 5 stars out of 5

An important paper. I enjoyed reading this paper as well as Prof Cookson's review. It is difficult to argue against a competency based curriculum. Nobody can deny that what a doctor can do is more important and better for patients rather than how long they have spent in gaining that knowledge. Best to avoid one camp or the other as all these areas are intimately related. Performance does have a direct relationship with knowledge. The judgement and higher order critical thinking is essential. A key function for a health professional is after all problem solving. I would agree that greater amount of feedback and direct observation are the way forward. The authors may wish to read the work of Profs Hilliard Jason and Jane Westberg, as in some ways the essence of their paper is also about adaptive education and supporting individual needs of the students. Practical examples of how the CBME was implemented would have been useful.

**Competing Interests:** No conflicts of interest were disclosed.

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John Cookson
University of Worcester

This review has been migrated. The reviewer awarded 4 stars out of 5

I found this a well written and well argued case for competency-based medical education. Nevertheless I feel that ‘it's a bit more complicated than that’. No one would deny that we need competent doctors. We can also recognise that lists of ‘competencies’ to be ‘ticked off’ are antithetical to real education. We must be aware that doctors who have ‘achieved all the competencies’ are not necessarily competent. Some of the most important attributes, such as self-awareness, response to feedback and so on, are the ones that are most difficult to define and therefore to assess. Expert judgement based on observation is good, multiple expert judgements even better but without a clear metric may be subject to error and difficult to defend in progress decisions. Progressive development towards a goal is fine but sooner or later someone, somehow, has to make a dichotomous decision; pass or fail.

**Competing Interests:** No conflicts of interest were disclosed.