

7. Competency-based Medical Education

A White Paper Prepared for the Royal College of Physicians and Surgeons of Canada, Future of Medical Education in Canada

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Summary of Key Points

- Competency frameworks such as CanMEDS, CanMEDS-FM used in family medicine residency education, and the Outcome Project of the (US) Accreditation Council for Graduate Medical Education form the basis of training for our medical learners.
- There is a spectrum of approaches for designing residency programs; from “Time-dependent” to “Time-free” with the ideal of “Competency-based, Time Rotations” in between, the characteristics of each are illustrated in Table 1.
- The rationale for CBME include:
 1. A focus on curricular outcomes
 2. An emphasis on abilities (competencies as the organizing principle of curricula)
 3. A de-emphasis of time-based training
 4. The promotion of learner-centredness
- This paper addresses the criticism of CBME

Summary of Recommendations

1. That the Royal College advocate for a CBME approach to curriculum planning that is focused on outcomes, inherently tied to the needs of those served by graduates, and involves explicit definitions of all essential domains of competence to be acquired.
2. That the Royal College emphasize competencies as an organizing framework for educators to design learning experiences that continuously incorporate prior learning elements and stress observable abilities.
3. That the Royal College establish a clearly defined process for delineating the competencies

4. That the Royal College provide incentives for medical school deans, department heads, clinical teaching faculty and government for their commitment to dedicated FTE numbers, funding etc. in support of implementing a CBME approach to design.
5. That the Royal College dismiss the notion of competency-based training as the antonym to time-based training and advocate for the view of time as a resource to be used to the advantage of the trainee.
6. That the Royal College explore with deans and educators their perspective on the need for and feasibility of CBME “hybrid” residency programs where the measurement of success is not dependent upon whether the curriculum is time-based or not. Instead, where success is measured by whether the curriculum increases competence of trainee.
7. That the Royal College promote a curriculum with flexible time periods as a means of increasing efficiency and shifting the focus of contemporary education in favour of developing the learner’s abilities.
8. That the Royal College enforce a basic time minimum and maximum for progression
9. That the Royal College collaborate with deans, educators and other stakeholders to develop reliable competency-based assessment tools and roll out the necessary faculty development to appropriately apply these tools.
10. That the Royal College collaborate with National Specialty Societies to establish a repository for tools and teaching strategies, to assess cross-cutting competencies, and which can be adapted to different specialties.

7. La formation médicale fondée sur les compétences

Livre blanc préparé pour le Collège royal des médecins et chirurgiens du Canada :
L'avenir de l'éducation médicale au Canada

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Sommaire des principaux enjeux

- Les cadres de compétences comme CanMEDS, CanMEDS-MF utilisés dans la formation des résidents en médecine familiale et l'Outcome Project (États-Unis) de l'Accreditation Council for Graduate Medical Education constituent la base de la formation pour nos médecins en formation.
- Les cadres proposent une gamme d'approches pour la conception des programmes de résidence; les caractéristiques de chaque type de programme sont illustrées dans le Tableau 1, de « dépendant du temps » à « temps libre », et l'idéal entre les deux, soit « temps de rotation basé sur les compétences ».
- La justification pour la formation médicale fondée sur les compétences (FMFC) comprend :
 1. un accent placé sur les résultats d'apprentissage;
 2. un accent sur les aptitudes (les compétences sont le principe organisationnel des programmes);
 3. une réduction de l'accent mis sur la formation basée sur le temps;
 4. la promotion d'une formation axée sur l'apprenant.
- Le présent livre blanc répond aux critiques sur la FMFC.

Sommaire des recommandations

1. Le Collège royal devrait promouvoir une approche axée sur la FMFC pour la planification de programmes de formation misant sur les résultats, intrinsèquement liée aux besoins de ceux qui sont desservis par les diplômés, et comprenant des

définitions claires de tous les domaines essentiels des compétences qui doivent être acquises.

2. Le Collège royal devrait mettre en valeur les compétences en tant que cadre organisationnel pour que les pédagogues conçoivent des expériences d'apprentissage qui incorporent constamment des éléments appris précédemment et mettent l'accent sur des aptitudes observables.
3. Le Collège royal devrait mettre en place un processus clair pour définir les compétences.
4. Le Collège royal devrait offrir des mesures incitatives aux doyens des écoles de médecine, aux chefs de départements, aux cliniciens enseignants et au gouvernement pour leur engagement en matière de nombres d'ETP désignés, de financement, etc., en appui à la mise en œuvre d'une approche de FMFC dans la conception des programmes.
5. Le Collège royal devrait rejeter la notion de formation fondée sur les compétences comme antonyme de la formation fondée sur le temps, et devrait encourager la notion du temps comme étant une ressource à utiliser à l'avantage des médecins en formation.
6. Le Collège royal devrait explorer avec les doyens et les pédagogues leurs points de vue sur le besoin et la faisabilité de programmes de résidence intégrant la FMFC où la mesure de la réussite n'est pas fonction d'un programme basé ou non sur le temps. La mesure de la réussite devrait plutôt se fonder sur le rehaussement des compétences du médecin en formation.
7. Le Collège royal devrait promouvoir un programme de formation dont les périodes de temps souples permettent d'augmenter l'efficacité, qui favorise le développement des aptitudes de l'apprenant.
8. Le Collège royal devrait imposer un temps de base minimal et maximal pour la progression.
9. Le Collège royal devrait collaborer avec les doyens, les pédagogues et d'autres intervenants à la mise en œuvre d'outils d'évaluation fiables fondés sur les compétences, et mettre sur pied un programme de perfectionnement des corps professoraux connexe afin que ces outils soient utilisés adéquatement.
10. Le Collège royal devrait collaborer avec les associations nationales de spécialistes en vue de mettre en place un dépôt pour les outils et les stratégies pédagogiques visant l'évaluation des compétences transversales qui pourraient être adaptées aux diverses spécialités.

Competency-based Medical Education

Introduction

The working group proposes that the Royal College and its partners consider progressive and feasible ways to improve the future of medical education with a greater focus on explicit competencies as a way to organize residency education.

In this white paper, the working group endorsed the definition of competency-based medical education (CBME) proposed by the International CBME Collaborators¹:

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 deemphasizes time-based training and promises greater accountability; flexibility, and learner-centredness.

CBME as an outcome-based approach to designing postgraduate medical education with an emphasis on competence by design instead of ad hoc. There is a need for the Royal College to reform its standards and design of PGME to enable a “progression of competence” through the achievement of milestones over the continuum of medical education. CBME should not be viewed as the antonym to traditional time-based education organized around predictable rotations. CBME is viewed as an approach to medical education where time is viewed as a resource for acquiring competencies.

This paper is organized into 4 sections:

1. background and current status of medical education in Canada with respect to CBME
2. challenges and drivers for change, which asks the questions “are we adequately preparing trainees for practice?” and “how can CBME be a solution to these challenges?”
3. criticisms of CBME
4. recommendations for achieving change.

Background and Current Status of Medical Education & Competencies

The literature on competency-based education (CBE) dates back over 60 years and has been used as an approach across multiple professions including social work, teacher

education and others.² Most recently, an issue of *Medical Teacher* devoted entirely to the discourse around CBME provides evidence of a resurgence of interest in the topic and its relation to ensuring competent graduates.

Over the last 15 years, “competencies”, or physician abilities, have evolved become the unit of medical educational planning in Canada and around the world. Competency frameworks such as CanMEDS,^{3,4} CanMEDS-FM used in family medicine residency education, and the Outcome Project of the (US) Accreditation Council for Graduate Medical Education⁵ form the basis of training for large numbers of medical learners. Yet, competency-based medical education as an approach to design is a fundamental change for some programs, especially when conceptualized as a contrast with the traditional time-based approach. A large number of contemporary residency programs around the world are still organized around the time a learner spends on defined rotations as a surrogate marker of competence. This approach would be unacceptable in other enterprises, and feel this needs to change in medicine.

We propose that CBME at the residency level can be incorporated within a time-based structure, and advocate for a hybrid model of competency-based, timed rotations. We believe that much of the resistance to a CBME approach stems from a perception that CBME equates to “time-free” learning and have developed Table 1 to illustrate a spectrum of approaches for designing residency programs. Examples of current CBME programs include: the U of T Orthopedic Surgery pilot project, and the pilot project of the Royal Australasian College of Psychiatry. Even today, many programs are somewhere between Time-Dependent and Hybrid.

The practice of medicine has changed remarkably over the past 100 years yet medical education is still modeled on changes proposed at the time of Osler and in the Flexner Report of 1910. As the certifying body for specialist physicians in Canada the Royal College should lead an evolution towards CBME in Canadian residency education.

Table 1. The spectrum of design approaches for residency curricula

Characteristic	Time-dependent	Hybrid: Competency-based, Timed Rotations	Time-free
Organizing Structure	Time spent on rotations	Progression of competence	Progression of Competency
Degree of Structure	Rotations & AHD	Structured flexible curriculum; rotations as only one learning method	Structured, learner-centred curriculum; time-independent; rotations secondary to learning
Role of Timed Rotations	Unit of curriculum	Resource for acquiring competencies	Irrelevant
Role of In-training assessment	"Pass rotations"	Document progression & milestone achievement	Document progression & milestone achievement
Role of summative assessment	Infer readiness for exam	Ensure achievement of competencies	Ensure achievement of competencies
Key assessment tools	ITER, FITER, oral	Portfolio; many others	Portfolio; others prn
Program focus	Processes for rotations	Acquisition of competency outcomes via rotations and other activities	Acquisition of competency outcomes
Teacher roles	Supervision, teaching	Supervision, teaching, direct observation	Supervision, teaching, direct observation
Learner roles	Service on rotations; academic contribution; study for exam	Ownership of learning; plot course for progression of competence through rotations	Ownership of learning; plot course for progression of competence through activities

Challenges and Drivers for Change

Medical educators face the criticism that our current PGME structure has become anachronistic, having been without fundamental change since its origin at the time of Osler. Medical knowledge and technology has been growing exponentially since the 1960's, leaving

our residents to master more than ever before. Furthermore, contemporary society is increasingly characterized by consumerism in healthcare. Medical information now readily available through the Internet to patients whose view of medical expertise is different from previous generations. In an era of accountability, society and governing bodies are demanding better assurance that the current system is producing competent residents in a more consistent fashion. Medical educators have a duty to ensure every graduate is equipped for practice.

The rationale for CBME has been outlined in a recent review article²:

1. *A focus on curricular outcomes*

Many curricula do not explicitly define the outcome abilities needed of graduates, let alone ensure they are learned, assessed and acquired failing to ensure that all medical graduates demonstrate competence in all domains of their intended practice. Furthermore, allowing ability in one essential domain to compensate for lack of ability in another does a disservice to both the profession and the public served.

2. *An emphasis on abilities (competencies as the organizing principle of curricula)*

The reductionism of objectives-based approaches has led to an over-emphasis on knowledge at the expense of skills, attitudes and higher order aspects of practice. Independent lists of knowledge objectives can create a program in which learning is not integrated across the curriculum.

3. *A de-emphasis of time-based training*

Much of contemporary medical education is oriented toward the amount of time spent in an aspect of training rather than the abilities actually acquired. Aspects of physician credentialing, such as eligibility for certification exams, also tend to focus on time spent on specific experiences.

4. *The promotion of learner-centredness*

A need exists for trainees to take responsibility for their progress and development. Curricula need to be more flexible, and tailored to individual paths to practice.

Criticisms of CBME

The following challenges posed by CBME are raised by critics⁶:

1. CBME promotes self-direction for the learning process, but not necessarily for the designation or definition of specific competencies. Thus, although learners will have more freedom to decide *how* to learn in a CBME model, they may have less freedom in deciding *what* to learn as competencies become codified

2. CBME presents challenges in the areas of the teaching and learning process, the feasibility of implementation, and issues around assessment. For the on-the-ground “users” of CBME (teachers, curriculum planners, and learners), practical issues of implementation can be intimidating:
 - a. Time-free training in “pure CBME”
 - i. Issues with the residents’ dual role as learners and service providers, a time-free model may cause major disruption of services if residents are progressing through residency at different rates.
 - ii. Potential for missing “hidden” competencies and not gaining the maturation into a professional identity which come from time spent seeing patients.
 - b. Resources
 - i. Switching over to a complete CBME process would take tremendous resources and rolling out a time-free competency-based curriculum for every training program in medical schools across Canada is not realistic.
 - c. Assessment
 - i. Procedurally-oriented disciplines are perhaps more readily amenable to CBME, how do we assess progression of competence in complex diagnostic specialties?
3. CBME is criticized for promoting reductionism.
4. CBME is said to be overly concerned with training to meet a threshold minimum level of competency and not with promoting excellence.

Recommendations

To address these criticisms, the working group proposes a number of directions for the Royal College and its partners to undertake.

“Competence” does not equal a list of learning objectives or reductionist tasks; it is a broad objective that necessitates an integration of knowledge, skills, and behaviours in practice.

1. That the Royal College advocate for a CBME approach to curriculum planning that is focused on outcomes, inherently tied to the needs of those served by graduates, and involves explicit definitions of all essential domains of competence to be acquired.

The compelling promise of CBME lies in its focus on outcomes and on ensuring the competence of graduates.

2. That the Royal College emphasize competencies as an organizing framework for educators to design learning experiences that continuously incorporate prior learning elements and stress observable abilities.
3. That the Royal College establish a clearly defined process for delineating the competencies

There is as yet an incomplete understanding, acceptance, and buy-in by teachers, learners, and educational administrators. Faculty, and in particular program designers, will need to be educated about the concept of CBME. Faculty must be trained in the broad aspects of CBME: program planning, teaching and supervision methods and possibly most important, assessment strategies.

4. That the Royal College provide incentives for medical school deans, department heads, clinical teaching faculty and government for their commitment to dedicated FTE numbers, funding etc. in support of implementing a CBME approach to design.
5. That the Royal College dismiss the notion of competency-based training as the antonym to time-based training and advocate for the view of time as a resource to be used to the advantage of the trainee.

The major challenges to designing and implementing CBME in its "pure" state mean that "hybrid" versions are the way forward.

6. That the Royal College explore with deans and educators their perspective on the need for and feasibility of CBME "hybrid" residency programs where the measurement of success is not dependent upon whether the curriculum is time-based or not. Instead, where success is measured by whether the curriculum increases competence of trainee.
7. That the Royal College explore aspects of curricula with flexible time periods as a means of increasing efficiency and shifting the focus of contemporary education in favour of developing the learner's abilities.
8. That the Royal College enforce a basic time minimum and maximum for progression

Competency, when achieved in the current system, is by a more passive process, assumed more than demonstrated. Novel formative and summative assessment tools such as encounter cards, and providing opportunities for direct observation, portfolios and multisource feedback will be needed, as well as more effective ways of assessing 'qualitative' factors.

9. That the Royal College collaborate with deans, educators and other stakeholders to develop reliable competency-based assessment tools and roll out the necessary faculty development to appropriately apply these tools.
10. That the Royal College collaborate with National Specialty Societies to establish a repository for tools and teaching strategies, to assess cross-cutting competencies, and which can be adapted to different specialties.

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