Striving for excellence

Developing a framework for the Triple C curriculum in family medicine education

Colla J. MacDonald MD **Martha McKeen** **Eric Wooltorton** MSc MD CCFP FCFP **Francois Boucher** MSc MD CCFP FCFP **Jacques Lemelin** MSc MD CCFP FCFP **Donna Leith-Gudbranson** MEd **Gary Viner** MSc MD CCFP FCFP **Judi Pullen**

Abstract

Problem addressed Postgraduate medical education programs will need to be restructured in order to respond to curriculum initiatives promoted by the College of Family Physicians of Canada.

Objective of program To develop a framework for the Triple C Competency-based Curriculum that will help provide residents with quality family medicine (FM) education programs.

Program description The Family Medicine Curriculum Framework (FMCF) incorporates the 4 principles of FM, the CanMEDs-FM roles, the Triple C curriculum principles, the curriculum content domains, and the pedagogic strategies, all of which support the development of attitudes, knowledge, and skills in postgraduate FM training programs.

Conclusion The FMCF was an effective approach to the development of an FM curriculum because it incorporated not only core competencies of FM health education but also contextual educational values, principles, and dynamic learning approaches. In addition, the FMCF provided a foundation and quality standard to designing, delivering, and evaluating the FM curriculum to ensure it met the needs of FM education stakeholders, including preceptors, residents, and patients and their families.

EDITOR'S KEY POINTS

- In 2010, the Department of Family Medicine at the University of Ottawa in Ontario began the process of restructuring its postgraduate medical education program to respond to curriculum initiatives by the College of Family Physicians of Canada.
- The Family Medicine Curriculum Framework was the first step in designing, delivering, and evaluating a family medicine (FM) program that aligned with the College of Family Physicians of Canada's standards in postgraduate education.
- The Family Medicine Curriculum Framework was an effective approach to FM curriculum development because it incorporated the core competencies of FM education, contextual educational values, and dynamic learning approaches.

This article has been peer reviewed.
Can Fam Physician 2012;58:e555-62

Lutter pour l'excellence

Élaborer un cadre pour le cursus Triple C dans l'enseignement de la médecine familiale

Colla J. MacDonald MD **Martha McKeen** **Eric Wooltorton** MSc MD CCFP FCFP **Francois Boucher** MSc MD CCFP FCFP **Jacques Lemelin** MSc MD CCFP FCFP **Donna Leith-Gudbranson** MEd **Gary Viner** MSc MD CCFP FCFP **Judi Pullen**

Résumé

Problème à l'étude Les programmes de deuxième cycle de la formation médicale devront être restructurés de façon à correspondre aux innovations suggérées par le Collège des médecins de famille du Canada.

Objectif du programme Élaborer un cadre pour le cursus triple C axé sur la compétence afin de fournir aux résidents des programmes de qualité pour la formation en médecine familiale (MF).

Description du programme Le Cadre du Cursus en Médecine Familiale (CCMF) intègre les 4 principes de la MF, soit, les rôles CanMEDS, les principes du cursus triple C, les domaines contenus dans le curriculum et les stratégies pédagogiques, des principes qui favorisent tous le développement des attitudes, connaissances et habilités au cours des programmes de deuxième cycle de la formation.

Conclusion Le CCMF représentait une façon efficace de développer un curriculum en MF parce qu'il intègre non seulement les compétences de base de la formation en MF mais aussi les valeurs pédagogiques contextuelles, des principes et des méthodes d'apprentissage dynamiques. De plus, le CCMF fournit la base et le standard de qualité pour élaborer, mettre en place et évaluer le curriculum en MF afin de s'assurer qu'il répond aux besoins des parties intéressées à la formation en MF, y compris les précepteurs, les résidents et les patients et leurs familles.

POINTS DE REPÈRE DU RÉDACTEUR

- En 2010, le département de médecine familiale de l'université d'Ottawa a entrepris de restructurer son programme de deuxième cycle pour se conformer aux directives du Collège des médecins de famille du Canada.
- Le cadre du cursus en médecine familiale représentait la première étape de l'élaboration, de la mise en place et de l'évaluation d'un programme de médecine familiale (MF) de deuxième cycle conforme aux normes du Collège des médecins de famille du Canada en matière de formation.
- Le cadre du cursus en médecine familiale s'est avéré un moyen efficace de développer un curriculum en MF parce qu'il intégrait les compétences de base de la formation en MF, les valeurs pédagogiques contextuelles et des méthodes d'apprentissage dynamiques.

Cet article a fait l'objet d'une révision par des pairs.
Can Fam Physician 2012;58:e555-62

Worldwide, the focus of medical education programs is shifting from a rotation-centric to a competency-based approach that helps specific roles and competencies to be achieved. In the United Kingdom, the General Medical Council has described elements of good practice in a model called Good Medical Practice.[1] In the United States, core competencies for physicians have been defined by at least 2 key groups: the Accreditation Council for Graduate Medical Education and the American Board of Medical Specialties.[2] The American Institute of Medicine has recommended the introduction of core skills or competencies and has created a structure for improving, reforming, and enhancing medical education and health care.[3]

In the 1980s, the 4 principles of family medicine (FM) were introduced by the College of Family Physicians of Canada (CFPC) to provide guidance and direction for FM practitioners and residency programs.[4] The 4 principles of FM emphasize the following:

- the importance of the doctor-patient relationship,
- the family physician being a skilled clinician,
- family medicine being a community-based discipline, and
- the family physician being a resource to a defined practice.[5]

The 4 principles of FM soon formed the foundation of undergraduate, residency, and continuing professional development medical education program objectives and evaluations.[6] They emphasize the important roles that family physicians play in areas beyond biomedical knowledge and expertise.[7] The Educating Future Physicians of Ontario Project in the 1980s and 1990s reviewed existing frameworks, including the 4 principles of FM, and defined 8 key roles of physicians (ie, medical expert, communicator, collaborator, health advocate, learner, manager ["gatekeeper"], scholar, and physician as person).[8]

These 8 roles were ultimately adapted between 1997 and 2002 by a Working Group on Societal Needs from the Royal College of Physicians and Surgeons of Canada (RCPSC) and led to the creation of a framework called CanMEDS. The CanMEDS framework was updated in 2005 to become a more generic competency-based model for health education (from undergraduate to postgraduate and continuing professional development).[9]

In 2009, a Working Group on Curriculum Review appointed by the CFPC released an adaptation of the original CanMEDS model.[10] This model, CanMEDS-FM, aligned with the original CanMEDS released by the RCPSC; however, it focused on the educational needs of medical students and residents learning to become family physicians.[7] The CanMEDS-FM model is based on 7 roles that encapsulate the competencies required to become a skilled and well-rounded family physician. **Table 1**[10] shows the critical CanMEDS-FM roles as defined by the CFPC.

Currently, the CanMEDS-FM model of education is being widely implemented in undergraduate FM programs across Canada. Residency programs are working to incorporate the competency-based model and replace the rotation- or time-based model. The new CanMEDS-FM curriculum will also place more emphasis on learning to be family physicians rather than other specialists and place FM preceptors at the forefront of

Table 1. The CanMEDS–Family Medicine roles, as defined by the College of Family Physicians of Canada

CanMEDS–Family Medicine roles	Definitions by the College of Family Physicians of Canada[10]
Family medicine expert	Family physicians are skilled clinicians who provide comprehensive, continuing care to patients and their families within a relationship of trust. Family physicians apply and integrate medical knowledge, clinical skills and professional attitudes in their provision of care. Their expertise includes knowledge of their patients and families in the context of their communities, and their ability to use the patient-centred clinical method effectively. As Family Medicine Experts they integrate all the CanMEDS-Family Medicine ... roles into their daily work
Communicator	[F]amily physicians facilitate the doctor-patient relationship and the dynamic exchanges that occur before, during, and after the medical encounter
Collaborator	[F]amily physicians work with patients, families, healthcare teams, other health professionals, and communities to achieve optimal patient care
Manager	[F]amily physicians are central to the primary health care team and integral participants in healthcare organizations. They use resources wisely and organize practices which are a resource to their patient population to sustain and improve health, coordinating care within the other members of the health care system
Scholar	[F]amily physicians demonstrate a lifelong commitment to reflective learning, as well as the creation, dissemination, application and translation of knowledge
Health advocate	[F]amily physicians responsibly use their expertise and influence to advance the health and well being of individual patients, communities, and populations
Professional	[F]amily physicians are committed to the health and well being of individuals and society through ethical practice, profession-led regulation, and high personal standards of behaviour

FM education. Ultimately, this will result in the further legitimization of FM as a discipline and go a long way toward ensuring that future generations of residents become well-rounded physicians who can provide superior care to their patients and society.

In addition to embracing the 4 principles of FM and the CanMEDS-FM roles, the CFPC is advancing postgraduate FM education in Canada by promoting the Triple C Competency-based Curriculum (Triple C). This competency-based curriculum is comprehensive, focused on continuity of education and patient care, and centred in FM. The CFPC website describes the goal of the Triple C curriculum as follows:

> [T]o ensure that all Family Medicine residents develop professional competence to the level of a physician ready to begin practice in the specialty of Family Medicine.[11]

The curriculum ensures that graduates are 1) competent to provide comprehensive care in any Canadian community; 2) prepared for the evolving needs of society; and 3) educated based upon the best available evidence on patient care and medical education.[11] The CFPC website continues to explain:

> This curriculum addresses accountability, social responsibility, patient safety, and efficiencies in educational programming. It highlights the College's vision of graduating sufficient numbers of Canadian family physicians who can provide comprehensive, continuing care within traditional family practices and within newer models of interprofessional practice.[11]

Striving for excellence in FM postgraduate education demands that curriculum designers invest considerable energy in the design, delivery, and evaluation of innovative programs to meet the learning needs of residents. The purpose of this paper is to share the process of developing the University of Ottawa (U of O) Family Medicine Curriculum Framework (FMCF) and exploring the role the framework has played in the delivery of a curriculum that incorporates the 4 principles of FM, the CanMEDS-FM roles, the Triple C curriculum principles, the curriculum content domains, and the pedagogic strategies that support the development of attitudes, knowledge, and skills for postgraduate FM training programs. The FMCF provides a foundation for FM education and sets a quality standard for the design, delivery, and evaluation of effective postgraduate FM programs.

The framework is a first step toward guiding *what* should be included in a comprehensive postgraduate FM curriculum in Canada. For the past 2 years, the Department of Family Medicine (DFM) at the U of O has been developing the educational learning objectives, teaching and learning strategies, and evaluation tools to align with this framework. Future publications will share the experience of *how* this framework guides the design, implementation, and evaluation of the Triple C curriculum for postgraduate FM education.

The FMCF development process

Early in 2010, the process to develop a competency-based curriculum framework for the DFM at the U of O was launched. The process incorporated the standards set by the CFPC, the RCPSC, and other formative medical education organizations; embraced the roles and competencies promoted through the CanMEDS-FM model, the values in the Triple C curriculum, and the 4 principles of FM, with pedagogic strategies (teaching, learning, and evaluation), into a comprehensive framework as a first step to guide the design, delivery, and evaluation of a revised postgraduate FM program. The framework was designed through collaboration with faculty members, residents, administrators, researchers, and health care education experts. Such collaborative efforts took advantage of existing resources and research findings to lead to higher standards. The framework was also designed to be easily adopted or adapted by any FM program in Canada.

An evidence-informed approach[12] was used in the FMCF process to define key concepts through a search of the literature and existing curricula, and a consensus approach was used to design the finalized framework. The intensive process of developing the FMCF occurred between April 2010 and September 2011 and included 6 full-day retreats with faculty members, researchers, residents, administrators, and health care educators (with an average of 25 participants at each of the 6 retreats). **Table 2** outlines the schedule of the 6 retreats, as well as the design process.

The FMCF was originally conceptualized by conducting a review of literature, an assortment of curricula documents, and other relevant materials published by the RCPSC and CFPC.[10,13] In addition, the curriculum team also reviewed curricula from other FM programs across Canada, Britain, Australia, and Europe (eg, The Royal Australian College of General Practitioners' "star of general practice"[14]). Factors that were hypothesized to affect the effectiveness of an FM curriculum were identified, and a framework was drafted by an initial team, including the director of postgraduate education, several faculty members, 2 members of the department's administrative team, and an education specialist. A series of meetings occurred over a 6-week period, as each facet of the FMCF was carefully scrutinized for meaning, language interpretation, and relevance. In addition, an intensive editing and revision process took place between meetings via e-mail.

The process of developing the FMCF was also enhanced and influenced by previous experience developing other curriculum frameworks and models, including the Framework for Global Health Education in Postgraduate FM Training,[15] the W(e)Learn Framework,[16] the Demand-Driven Learning Model,[17] and the Partnership Learning Model.[18] To ensure the FMCF would be relevant and practical to the intended end users (those who developed, delivered, and evaluated FM curricula, and the residents who received the education), all stakeholders were closely involved in the development process. Stakeholders included preceptors and residents from all 7 of the department's teaching units, as well as numerous community and rural teaching practices. The process of developing the FMCF was also heavily influenced by the work already completed by the DFM at Queen's University in Kingston, Ont. The curriculum team adopted the concept of Curriculum Review Advisory Groups (CRAGs) and appointed subject matter experts in 8 domains of FM (**Figure 1**). The CRAGs were tasked with providing content for each of their respective knowledge areas and served as advisory groups throughout the entire curriculum review process.

The series of CRAG meetings along with detailed agendas were all planned in advance. However, the process evolved over time to align with the progress being made on the curriculum framework and modifications (**Table 2**).

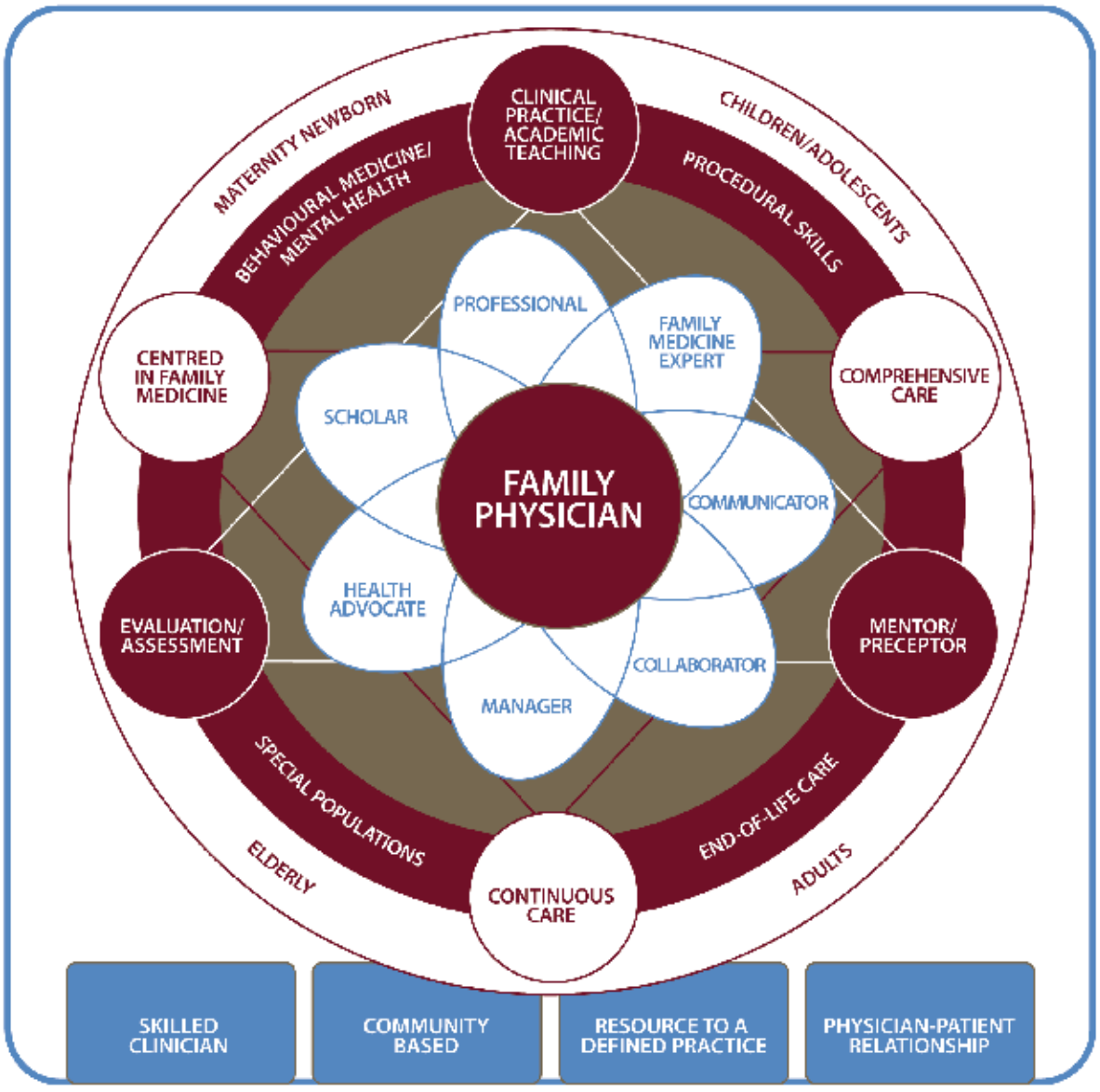
Table 2. Outline of the process of the CRAG meetings

CRAG MEETINGS	PROCESS OF DESIGNING THE FMCF
May 2010 (first all-day retreat)	• FMCF and its accompanying write-up were presented in draft format (ie, draft 1) • Following the presentation and a discussion, work groups were formed to critique and provide feedback on the framework • Work groups presented their ideas to the larger group; this was followed by an intensive plenary debate • Revised FMCF (ie, draft 2) was sent to retreat attendees via e-mail to solicit feedback • Additional minor suggestions and changes were incorporated over the next few months
October 2010 (second all-day retreat)	• Draft 2 of the FMCF and an accompanying revised write-up were presented • Participants provided feedback • Comments and suggestions were recorded and integrated over the next month • Definitions for the terms in the FMCF were drafted based on relevant literature • Additional information concerning pedagogic strategies was developed by the educational specialist to ensure the framework was grounded in educational theory • Definitions were sent to the small core curriculum working group (director of postgraduate education, administrators, 2 preceptors, including the Director of Evaluations, and the education specialist) to garner clarification, suggestions, and recommendations.
January 2011 (third all-day retreat)	• Draft 3 of the FMCF, the accompanying revised write-up, and the definitions were presented • The presentation and discussion of the FMCF generated more "buy in" from stakeholders • Minor suggestions and recommendations were recorded and incorporated
March 2011 (fourth all-day retreat)	• In mid-February 2011, all retreat attendees were e-mailed draft 4 of the FMCF, the accompanying write-up, and the definitions of terms • At the retreat, participants had the opportunity to approve the draft or provide further comments and recommendations • Additional minor suggestions were received and implemented. These changes included the following: creating a more inclusive description of *procedural skills*; changing the name of Behavioural Medicine to Behavioural Medicine and Mental Health; and including principles of adult education into the write-up of the framework • Final draft of the FMCF was professionally programmed into an interactive version, allowing the definition of the terms to emerge when "moused" over
May 2011 (fifth all-day retreat)	• Interactive version of FMCF was shared with participants • Framework was sent for French translation to accommodate our Francophone preceptors and residents • There were discussions on the generation of learning strategies and evaluation tools, as well as the concept of an e-portfolio or e-dossier • Curriculum search tool (online curriculum database) was also introduced as a mechanism to logically sort through the learning objectives, strategies, and corresponding CanMEDS–Family Medicine roles and 99 key priorities
October 2011 (sixth all-day retreat)	• Functionality of the curriculum search tool was elaborated on • Revised evaluation tools were presented and feedback was recorded for implementation purposes

CRAG—Curriculum Review Advisory Group, FMCF—Family Medicine Curriculum Framework.

The end product of this exhaustive process has been the development of an educational framework that provides a visual representation of the principles, core competencies, and pedagogic strategies to support the development of attitudes, knowledge, and skills for postgraduate FM training programs. Each CanMEDS-FM–oriented core competency identifies the knowledge and skills necessary to provide effective primary care to diverse patients. Achieving these competencies takes place through a balance of theoretical and practical learning experiences. Curriculum content can be delivered through a variety of methods, including seminars, case-based learning sessions, small study groups, one-on-one case discussions, individual readings, simulations, and e-learning. Through the course of their theoretical and practical training, and in particular through formal mentorship with a preceptor, it is expected that residents will understand, appreciate, and demonstrate behaviour and attitudes that are consistent with the values and principles outlined in the framework. An understanding of all elements of the framework will be enhanced through regular and structured self-reflection and evaluation. The framework can be downloaded from **http://familymedicine.uottawa.ca/curriculum-framework/curriculum.html.**

Figure 1. Family medicine Triple C Competency-based Curriculum framework



Collaboration

During the 1.5-year process of developing the FMCF, several discussions and focused debates on the design and content were resolved in a collaborative manner, leading to the refinement of the FMCF. For example, there was a lengthy discussion about whether the centre of the FMCF and its ultimate focus should be "family physician" or "FM expert." While at first glance, this debate might have seemed trivial, it actually helped develop an underlying philosophy behind the curriculum by placing the emphasis on the importance of the family physician in contrast to the FM expert. Thus, by placing "family physician" in the centre of the FMCF, the CRAG members essentially declared that the ultimate goal of the curriculum should be to develop a well-rounded family physician by incorporating all of the CanMEDS-FM roles as opposed to solely a clinically proficient FM expert. Moreover it was decided that an additional petal of "FM expert" would be added to the existing 6 CanMEDS-FM petals to ensure that the development of a family physician's clinical knowledge be incorporated into the framework.

The FMCF originally featured 3 boxes depicting the Triple C curriculum (comprehensive and focused on continuing care; competency-based, and centred in FM). However, upon learning that the CFPC's definition of Triple C had evolved, the 3 boxes were changed to comprehensive, focused on continuity of education and patient care, and centred in FM. A box surrounding the diagram was added to demonstrate that all of the facets of the framework taken together collectively comprised the competency-based curriculum.

Evaluation

At the fifth retreat (May 2011), a survey was distributed to 28 CRAG members. Participants included faculty members and residents. The purpose of the survey was to obtain information related to CRAG members' attitudes toward the curriculum restructuring process and the FMCF in particular. Fifteen surveys were completed. Most participants indicated that their attitude toward the curriculum process had become more positive over the 1-year period of the restructuring process. One participant commented, "I was not impressed after the first retreat, but work over the summer [of] 2010 changed my mind." Moreover, participants indicated they had come to appreciate the FMCF as a useful tool in redesigning the curriculum. Participants reported that enthusiasm toward the FMCF began to become more widespread as family physicians and residents recognized their voices had been heard and their suggestions and recommendations from the first retreat were incorporated. One participant explained, "This has been an excellent process and I hope we will use similar processes in the future for other aspects of program improvement."

These findings emphasize the importance of having end users involved in the curriculum redesign process. Additionally, CRAG members reported they understood the practical value of the framework as a quality standard in designing, delivering, and evaluating the revised curriculum. This collaborative process strengthened positive attitudes toward the restructuring process and contributed to team building. One participant said, "I learned from the process. I built a 'community of practice': my educator colleagues." Finally, developing the curriculum framework demonstrated that implementing educational theory can enhance medical education.

Conclusion

The FMCF is an effective approach to FM curriculum development because it incorporates not only core competencies for FM health education but also contextual educational values, principles, and dynamic learning approaches. In addition, the FMCF provides a foundation and quality standard to design, deliver, and evaluate FM curriculum to meet the needs of FM education stakeholders, including preceptors, residents, and patients and their families. This achievement is the first step toward providing curricular consistency in the FM program at the U of O and might serve as a model for other FM programs across Canada. We hope our collaborative efforts will reduce redundancy in curriculum development and research initiatives, utilize strengths and expertise of FM faculty members and residents, and result in greater quality, credibility, and productivity in FM education. This paper introduces the DFM's FMCF as a conceptual first step in designing, delivering, and evaluating FM programs to align with the recently revised CFPC standards in postgraduate education. We also hope that other DFMs can benefit from our experiences and adapt or adopt the framework applications and methodologies to improve the effectiveness of FM curriculum development and delivery.

Dr MacDonald is Professor in the Faculty of Education, with cross-appointment in the Faculty of Medicine; **Ms McKeen** is Manager of Special Projects in the Department of Family Medicine; **Dr Wooltorton** is a family physician in the Department of Family Medicine; **Dr Boucher** is Postgraduate Director in the Department of Family Medicine; **Dr Lemelin** is Chair of the Department of Family Medicine; **Ms Leith-Gudbranson** is Director of Evaluations and Associate Professor in the Department of Family Medicine; **Dr Viner** is Associate Professor in the Department of Family Medicine; and **Ms Pullen** is Chief Operating Officer in the Department of Family Medicine, all at the University of Ottawa in Ontario.

Acknowledgment

We thank the Residents and Administration in the Department of Family Medicine at University of Ottawa, the Department of Family Medicine at Queen's University, and the Ontario Global Health Family Medicine Curriculum Working Group. We thank **Nicholas Papiccio** and **Rong Sun** for programming the framework.

Competing interests

None declared

Correspondence

Dr Colla J. MacDonald, Faculty of Education, University of Ottawa, 145 Jean Jacques Lussier, Ottawa, ON K1N 6N5; telephone 613 562-5800, extension 4110; fax 613 623-8792; e-mail **cjmacdon@uottawa.ca**

References

1. General Medical Council [website]. *Good medical practice.* London, UK: General Medical Council; 2012. Available from: **www.gmc-uk.org/guidance/good_medical_practice.asp.** Accessed 2012 Sep 5.
2. Leach DC. A model for GME: shifting from process to outcomes. A progress report from the Accreditation Council for Graduate Medical Education. *Med Educ* 2004;38(1):12-4.
3. American Institute of Medicine. *Crossing the quality chasm: a new health system for the 21st century.* Washington, DC: National Academy Press; 2001.
4. Rosser W. Sustaining the 4 principles of family medicine in Canada. *Can Fam Physician* 2006;52:1191-2 (Eng), 1196-7 (Fr).
5. Kelly L. Four principles of family medicine. Do they serve us well? *Can Fam Physician* 1997;43:1902-4 (Eng), 1909-12 (Fr).
6. Challis EB, Grant IN, McNab JW, Morrissy JR, Rae DW, Rainsberry RP, et al. *Report of the Task Force on Curriculum, Section of Teachers of Family Medicine*. Mississauga, ON: College of Family Physicians of Canada; 1989.
7. Tannenbaum D, Konkin J, Parsons E, Saucier D, Shaw L, Walsh A, et al. *Triple C competency-based curriculum. Report of the Working Group on Postgraduate Curriculum Review—part 1.* Mississauga, ON: College of Family Physicians of Canada; 2011. Available from: **www.cfpc.ca/uploadedFiles/Education/_PDFs/TripleC_Report_English_w_cover_Sep29.pdf**. Accessed 2012 Sep 5.
8. Neufeld VR, Maudsley RF, Pickering RJ, Turnbull JM, Weston WW, Brown MG, et al. Educating future physicians for Ontario. *Acad Med* 1997;73(11):1133-48.
9. Frank JR, editor. *The CanMEDS physician competency framework. Better standards. Better physicians. Better care*. Ottawa, ON: Royal College of Physicians and Surgeons of Canada; 2005. Available from: **www.royalcollege.ca/portal/page/portal/rc/common/documents/canmeds/resources/publications/framework_full_e.pdf**. Accessed 2012 Sep 5.
10. Tannenbaum D, Konkin J, Parsons E, Saucier D, Shaw L, Walsh A, et al. CanMEDS–family medicine: working group on curriculum review. Mississauga, ON: College of Family Physicians of Canada; 2009. Available from: **http://cfpc.ca/uploadedFiles/Education/CanMeds%20FM%20Eng.pdf**. Accessed 2012 Sep 5.
11. College of Family Physicians of Canada [website]. *Triple C competency-based curriculum: Canada's family medicine curriculum.* Mississauga, ON: College of Family Physicians of Canada; 2012. Available from: **www.cfpc.ca/Triple_C**. Accessed 2012 Feb 8.
12. Pope C, Mays N, Popay J. *Synthesising qualitative and quantitative health research: a guide to methods*. Maidenhead, UK: Open University Press; 2007.
13. Allen T, Bethune C, Brailovsky C, Crichton T, Donoff M, Laughlin T, et al. *Defining competence for the purposes of certification by the College of Family Physicians of Canada: the evaluation objectives in family medicine.* Mississauga, ON: College of Family Physicians of Canada; 2010. Available from: **www.cfpc.ca/uploadedFiles/Education/Defining%20Competence%20Complete%20Document%20bookmarked.pdf**. Accessed 2012 Sep 9.
14. Royal Australian College of General Practitioners. *Curriculum for Australian general practice*. South Melbourne, Australia: Royal Australian College of General Practitioners; 2007. Available from: **www.racgp.org.au/curriculum**. Accessed 2012 Sep 5.
15. Redwood-Campbell L, Pakes B, Rouleau K, MacDonald CJ, Arya N, Purkey E, et al. Developing a curriculum framework for global health in family medicine: emerging principles, competencies, and educational approaches. *BMC Med Educ* 2011;11:46.
16. MacDonald CJ, Stodel EJ, Thompson TL, Casimiro L. W(e)Learn: a framework for online interprofessional education. *Int J Electron Healthc* 2009;5(1):33-47.
17. MacDonald CJ, Stodel EJ, Farres LG, Breithaupt K, Gabriel MA. The demand-driven learning model: a framework for Web-based learning. *Internet High Educ* 2001;4(1):9-30.
18. MacDonald CJ, Gabriel MA. Toward a partnership model for Web-based learning. *Internet High Educ* 1998;1(3):203-16.

* * *