

# TABLE OF CONTENTS

## HOW DO WE TEACH?

### -SPECIAL ARTICLES-

- The Transformational Path Ahead:  
Competency-Based Medical Education  
in Family Medicine* **3**  
Eric S. Holmboe, MD

### -COMMENTARIES-

- Competency-Based Education in Family  
Medicine Residency Education* **10**  
John Saultz, MD

- Learning from the Implementation of  
Milestones* **13**  
Suzanne Allen, MD, MPH

- The Evolution of Residency Training in  
Family Medicine: A Canadian  
Perspective* **15**  
Nancy Fowler, MD, CCFP, Francine Lemire, MD,  
CM, CCFP, CAE, ICD.D, Ivy Oandasan, MD, CCFP,  
MHSc, and Roy Wyman, MD, CCFP

# TABLE OF CONTENTS

## **-COMMENTARIES-**

*The Case for the 4-Year Residency in  
Family Medicine* **19**  
Alan B. Douglass, MD

*The Case for 3 Years of Family Medicine  
Residency Training* **23**  
Donald Raj Woolever, MD

*What Family Medicine Can Learn from  
Other Specialties* **26**  
Warren P. Newton, MD, MPH, and Michael K.  
Magill, MD

*Promoting Active Learning in Residency  
Didactic Sessions* **28**  
Todd Zakrajsek, PhD, and Warren P.  
Newton, MD, MPH

# The Transformational Path Ahead: Competency-Based Medical Education in Family Medicine

Eric S. Holmboe, MD

**ABSTRACT:** Competency-based medical education (CBME) is an outcomes-based approach that has taken root in residency training nationally and internationally. CBME explicitly places the patient, family, and community at the center of training with the primary goals of concomitantly improving both educational and clinical outcomes. Family medicine, as the foundational primary care discipline, has always embraced the importance of linking training with health system needs and performance since its inception. While CBME is no longer a new concept, full implementation of this outcomes-based approach has been daunting and challenging. Gaps in the effectiveness, safety, equity, efficiency, timeliness, and patient/family centeredness of health and health care in the United States continue to be persistent and pernicious. These gaps summon family medicine and the entire graduate medical education system to take stock of its current state and to examine how more fully embracing an outcomes-based educational approach can help to close these gaps.

This article provides a brief history of the CBME movement, and more importantly, its key underlying educational principles and science. I will explore the key inflection points of progress, including identifying core CBME components, introduction of competency Milestones, experimental pilots of time variable training, advancements in mastery-based learning, and advances in work-based assessment, within the context of family medicine. I will conclude with suggestions for accelerating the adoption and implementation of CBME within family medicine residency training.

(Fam Med. 2021;53(7):583-9.)

doi: 10.22454/FamMed.2021.296914

Published Online First May 17, 2021

The origins of competency-based medical education (CBME) began soon after family medicine became a recognized medical specialty. In 1978 the World Health Organization (WHO) published a white paper entitled *Competency-based Curriculum Development in Medical Education*.<sup>1</sup> This report was heavily influenced by the need for medical education to better meet public health needs in both developed and

developing nations. The authors proposed three important principles of a competency-based curriculum. First and foremost, the curriculum had to be organized around the competencies (ie, abilities) that were needed for practice within a specified setting. Second, the design of the curriculum and instruction should enable all learners to master the basic performance competencies of the profession and specialty discipline for

the setting of future practice. Finally, they argued education should be viewed as an experiment where both the “processes and techniques” that are used to create the learning should be philosophically treated as hypotheses that are constantly tested and refined.

McGaghie and colleagues importantly argued that mastery-based learning should be the underlying educational principle for all of medical education. This requires meaningful entry-level assessment, stepwise instruction, flexible time scheduling, and frequent assessment that facilitates “cumulative learning along a continuum of increasing medical sophistication.” Ultimately,

the intended output of a competency-based program is a health professional who can practice medicine at a defined level proficiency in accord with local conditions to meet local needs.<sup>1</sup>

I suspect these original tenets will resonate deeply with educators in family medicine, a specialty discipline firmly grounded in public health and focused on community needs since its inception. Unfortunately, these early CBME principles did not take firm root in undergraduate or graduate medical education at that time, due to several factors.

From the Accreditation Council for Graduate Medical Education, Chicago, IL.

One major factor was, and still is, inertia for change in medical education.<sup>2</sup> Another is the continued misalignment between appropriate service and educational needs. Health care is a service profession, but learners should be performing services best aligned with their professional development needs and patient care.<sup>3</sup> Finally, high-quality assessments, especially work-based assessments, were quite limited in 1978, and impeded progress in assessing competencies beyond medical knowledge.

The next catalyst for educational change in the United States began in the late 1980s with growing concerns around the quality and safety of health care. This concern culminated in two Institute of Medicine (IOM, now the National Academy of Medicine) reports, *To Err is Human* (2000) and *Crossing the Quality Chasm* (2001).<sup>4,5</sup> The *To Err is Human* report estimated that 98,000 Americans died each year from medical errors; a sobering number a more recent study concluded was probably substantially higher.<sup>6</sup> McGlynn and colleagues in their landmark study found that Americans were, on average, only receiving 54% of recommended clinical care practices.<sup>7</sup> Recognition of health care quality and safety problems helped rekindle interest in outcomes-based medical education in several countries, including the United States. In 1999, a joint Accreditation Council for Graduate Medical Education (ACGME) and American Board of Medical Specialties effort led by Dr Paul Batalden produced the general competency framework.<sup>8</sup> In July 2001, the ACGME launched the Outcome Project to guide the transformation of graduate medical education (GME) using the six new general competency domains to support implementation of an outcomes-based medical education system.<sup>8</sup>

A major goal of the Outcome Project was to move away from an over-reliance on proxies such as amount of time spent training, completion of a required number of curricular

rotations based on medical content and settings, and high-stakes examinations. Yet the predominant model of GME still relies substantially on “dwell time” as a proxy for competence. David Hodges, MD, PhD, used the metaphor of leaving a tea-bag in just long enough until a masterful cup of tea is produced.<sup>9</sup> This time-based model erroneously assumes everyone learns at the same pace, in the same way, and ends up at the same place. No one argues that a certain amount of experience and time is essential to produce a proficient family physician prepared to meet community needs, as envisioned by the WHO report over 40 years ago. However, not enough attention has been focused on how time and experience is used to support successful educational outcomes.

Competency-based medical education (CBME) has taken root as an approach because it places the patient, family, and community more explicitly at the center of training with a primary goal of increasing the effectiveness of the medical education system.<sup>10</sup> CBME recognizes the intimate relationship between clinical and educational outcomes, and calls for greater accountability of the medical education system. Specifically, summative entrustment decisions must be grounded in a robust competency-based curriculum and valid assessment. The six aims from the original Institute of Medicine report apply equally to medical education and undergird CBME: training should be patient-centered, safe, effective, equitable, timely, and efficient.<sup>5</sup> CBME is best viewed as a complex intervention with multiple interacting and interdependent components, a long journey that began over 20 years ago and will continue into the foreseeable future.

### Early Stumbles and Inflection Points of Progress

Early experience with implementation of the Outcome Project was arduous as programs struggled to make sense of the competencies, incorporate them into new curricula,

and institute new assessment approaches. It was, and continues to be, difficult to move away from a heavy reliance on a rotational curricular model for specialties like family medicine. Complicating the shift to CBME has been the ongoing intense changes in health care delivery since 2001, and medical education across the continuum has struggled to keep pace and appropriately adjust.<sup>11</sup> However, the last 10 years has seen some meaningful progress on multiple fronts, including promising experiments in CBME. Key inflection points of progress include:

- Refinement of the definition and components of CBME;
- Introduction of Milestones;
- Experimental pilots of time-variable training;
- Advancement of mastery-based learning models; and
- Advances in assessment.

Let's briefly review each of these in the context of family medicine as it grapples with its future.

### *Refinement of the Definition and Components of CBME*

In 2010, an international group of medical educators updated and refined the definition of CBME:

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 de-emphasizes time-based training and promises greater accountability, flexibility and learner-centeredness.<sup>12</sup>

More recently, van Melle et al performed a robust literature review followed by an international Delphi process to define and delineate the core components of CBME, providing additional guidance for developing CBME programs (Table 1).<sup>13</sup>

There are several important observations about the core components framework. First, CBME is grounded in a rich amalgam of multiple pedagogical theories and

**Table 1: Van Melle Framework for Competency-Based Medical Education<sup>1</sup>**

Component	Description
An outcomes-based competency framework	<ul style="list-style-type: none"> <li>• Desired outcomes of training are identified based on societal needs.</li> <li>• Outcomes are paramount so that the graduate functions as an effective health professional.</li> </ul>
Progressive sequencing of competencies	<ul style="list-style-type: none"> <li>• In CBME, competencies and their developmental markers must be explicitly sequenced to support learner progression from novice to master clinician.</li> <li>• Sequencing must consider that some competencies form building blocks for the development of further competence.</li> <li>• Progression is not always a smooth, predictable curve.</li> </ul>
Learning experiences tailored to competencies in CBME	<ul style="list-style-type: none"> <li>• Time is a resource, not a driver or criterion.</li> <li>• Learning experiences should be sequenced in a way that supports the progression of competence.</li> <li>• There must be flexibility to accommodate variation in individual learner progression.</li> <li>• Learning experiences should resemble the practice environment.</li> <li>• Learning experiences should be carefully selected to enable acquisition of one or many abilities.</li> <li>• Most learning experiences should be tied to an essential graduate ability.</li> </ul>
Teaching tailored to competencies	<ul style="list-style-type: none"> <li>• Clinical teaching emphasizes learning through experience and application, not just knowledge acquisition.</li> <li>• Teachers use coaching techniques to diagnose a learner in clinical situations and give actionable feedback.</li> <li>• Teaching is responsive to individual learner needs.</li> <li>• Learners are actively engaged in determining their learning needs.</li> <li>• Teachers and learners coproduce learning.</li> </ul>
Programmatic assessment (ie, program of assessment)	<ul style="list-style-type: none"> <li>• There are multiple points and methods for data collection.</li> <li>• Methods for data collection match the quality of the competency being assessed.</li> <li>• Emphasis is on workplace-based assessment.</li> <li>• Emphasis is on providing personalized, timely, meaningful feedback.</li> <li>• Progression is based on entrustment.</li> <li>• There is a robust system for decision-making.</li> <li>• Good assessment requires attention to issues of implicit and explicit bias that can adversely affect the assessment process.</li> </ul>

<sup>1</sup> Van Melle E, Frank JR, Holmboe ES, Dagnone D, Stockley D, Sherbino J; International Competency-based Medical Education Collaborators. A core components framework for evaluating implementation of competency-based medical education programs. *Acad Med.* 2019;94(7):1002-1009.

Abbreviation: CBME, competency-based medical education.

approaches. While we unquestionably need more research, innovation, and experimentation, CBME is an evidence-informed approach utilizing lessons from multiple research disciplines and fields.<sup>13</sup> Second, the core components do not represent the totality of a GME program. Neither the six general competencies nor the five core components were designed to represent all the complexity of a discipline. There is still a deep need for the experience, wisdom, and expertise of local health care faculty. CBME should always be philosophically viewed using a “both-and” lens that combines meaningful standardization where appropriate, and the flexibility and adaptability needed.<sup>14</sup> Family medicine may be

unique in this regard given the heterogeneous geographic regions and scope of practice where training programs are located. Family medicine programs will need to find the right balance between appropriate standardization of content and experience and the need to meet variable local and regional health care needs. Third, these components strongly argue residency programs should treat time as a resource and not as an intervention. Experience is essential, but it must be the right type of experience combined with programmatic assessment, feedback, and coaching.<sup>15,16</sup>

Coaching is being increasingly embraced as a core educational activity and is essential to CBME. Deiorio

and colleagues define an academic coach as:

a person assigned to facilitate learners achieving their fullest potential. Coaches work with learners by evaluating performance via review of objective assessments, assisting the learner to identify needs and create a plan to achieve these, and helping the learner to be accountable. Coaches help learners improve their own self-monitoring, while modeling the idea that coaching will likely benefit them throughout their career.<sup>17</sup>

In contrast to a coach, a mentor is usually a senior faculty member who serves more as guide in the learner's

career choices and development. Advisers within training programs are typically assigned to residents to provide basic oversight, advice, advocacy, and guidance to the learner.<sup>17</sup>

Finally, residency is an intensely developmental period, a fact only implicitly acknowledged in the past. This lack of explicit attention to learning trajectories and the stages of professional development may no longer be tenable. The leaders of the Outcome Project recognized this—the stage model of professional development heavily influenced the creation of the general competencies.<sup>8,18</sup> The intense developmental nature of residency only serves to highlight the importance of van Melle’s core components and the need for longitudinal feedback and coaching.<sup>13</sup> However, teaching, feedback, and coaching cannot be fully effective without shared mental representations of the general competencies.<sup>16</sup>

#### *Introduction of the Milestones*

Lack of a shared understanding of the competencies, especially the newer competencies of systems-based practice (SBP) and practice-based learning and improvement (PBLI), hampered early implementation efforts. After a series of pilot projects, the Milestones were formally implemented as part of accreditation for seven specialties in 2013 and for family medicine in 2014.<sup>19,20</sup> In 2020, family medicine became part of an early group of core specialties to begin using Milestones version 2.0.<sup>21</sup> The goal of the Milestones is to create developmental language (ie, narratives) that can support shared understanding of the core competencies in family medicine among faculty and residents. Milestones are specifically designed to be used as a formative, lower-stakes tool. This enables ongoing refinement and revision to meet the needs of the specialty. Family medicine has been one of the pioneers in early validity work, and a recent qualitative study in family medicine and three other specialties has found that implementation of Milestones is also a

developmental, iterative, and continuous improvement process.<sup>22,23</sup> Milestones should be viewed as a bridge to help implement outcomes-based education based on a competency framework, and can help to continually define and refine the core abilities of the specialty in alignment with ongoing changes in the health care delivery system.

#### *Experimental Pilots*

While there is a legitimate chorus of CBME criticism asking important questions,<sup>24</sup> several important pilot projects have demonstrated implementation of time-variable CBME is possible. The University of Toronto Orthopedic residency, leveraging a mastery-based, deliberate practice approach found residents could successfully graduate earlier than the standard 5-year program.<sup>25</sup> More recently, the Educating Pediatricians Across the Continuum (EPAC) also found medical students enrolled in a CBME program could matriculate earlier into residency at variable time points during the fourth year of medical school.<sup>26,27</sup> The EPAC project particularly highlighted the importance of empowering medical students in their own learning and assessment and the need for longitudinal relationships with faculty, elements well-suited for family medicine training. Finally, Queens University in Canada implemented time-variable residency programs for all its specialties in 2017. While data gathering on the experience with this new residency design is ongoing, the Queens University team published their initial experience with early implementation, highlighting the iterative, developmental nature and the need for flexibility and adaptation along the journey.<sup>28</sup> Finally, the Macy Foundation published the results of a summit highlighting the potential of time-variable training from both an effectiveness and efficiency perspective, noting training for some learners should be extended beyond traditional norms.<sup>29</sup>

#### *Advancement of Mastery-Based Learning*

The need for mastery-based learning was recognized in the original 1978 WHO report, but applying this educational approach has proven challenging.<sup>1</sup> As noted above, it was a central tenet in the Toronto Orthopedics pilot.<sup>25</sup> Substantial research has accumulated since the WHO report demonstrating the power of mastery-based learning and assessment to better prepare physicians and provide patients with higher quality and safer care.<sup>30</sup> Mastery-based learning requires a move away from the “see one, do one, teach one” mindset and arbitrary volumetrics around experience that lack supporting evidence. Mastery-based learning requires the learner do as much practice and assessment as required to meet a mastery standard of performance, including competencies beyond procedural skills.<sup>31</sup> Medical interviewing, physical examination, and shared decision-making with patients are the *core* procedures of family medicine. Family medicine will need to shift from its traditional number metrics approach and adopt more mastery-based learning and assessment across multiple competencies.<sup>32</sup> This is not to say volume of experience does not matter, but rather whatever volume of experience is required of the individual resident should be deliberately planned and delivered. This can be a daunting challenge for a field as broad and simultaneously deep as family medicine. The question for family medicine is what are the consequences of not moving in this direction, given the potentially negative implications for patients and communities as evidence accrues on the effectiveness of mastery-based approaches in generating better outcomes.

#### *Advances in Assessment*

CBME requires a robust, multifaceted program of assessment, often referred to as programmatic assessment, and is one of the five core components (Table 1).<sup>12,33</sup> While traditional assessments such as

knowledge examinations will remain an important part of programmatic assessment, family medicine will need to find the right combination of assessments to support the professional development of its residents and make summative entrustment decisions on behalf of the public.<sup>34</sup> Better assessment approaches for the competencies of professionalism, practice-based learning and improvement, and systems-based practice are especially urgent.

This combination will need to increasingly include simulation (especially for procedural and communication competencies performed by family physicians), using mastery-based standards, along with a combination of work-based assessments such as direct observation, multi-source feedback, patient experience surveys, quality and safety measures, and assessment of clinical reasoning “in vivo.” While much work remains to be done, an increasing number of tools and research have been developed and studied since the launch of the Outcome Project.<sup>8</sup>

Programs of assessment must also transition to a developmental, longitudinal mindset. Learning trajectories differ among residents, a fact acknowledged in the 1978 WHO report. Competency Milestones provide narratives that can serve as the core developmental assessment rubric that should guide the appropriate choice of assessment methods. Entrustable professional activities (EPAs) are another developmental assessment framework that can integrate needed physician abilities (aka competencies) in more holistic activities, such as care of patients with chronic disease, pregnancy, and so forth.<sup>35</sup> Competency Milestones and EPAs are complementary and can help in the design of effective assessment programs.

Another important change in assessment was the introduction of clinical competency committees (CCCs) concomitantly with the

Milestones. Group process, when done well, leads to better judgment, more robust feedback to residents, and ultimately better entrustment decisions. Effective CCCs synthesize assessment data to make valid developmental judgments that support learner development, help identify struggling learners earlier, and activate learners to coproduce their learning.<sup>37,38</sup>

Finally, the role of the resident in the assessment program requires rethinking. Residents must become active agents in the assessment process through coproduction.<sup>38,39</sup> Coproduction in medical education can be defined as

making better use of each other's assets, resources and contributions to achieve better [educational and clinical] outcomes or improve efficiency.

Coproduction involves the interdependent work of learners, faculty, other health professionals, and patients that is intentionally and deliberately designed to contribute to the desired educational outcomes of learners and the desired health of individuals and populations.<sup>38</sup> For too long assessment has been something GME programs do *to* residents instead of *with* them. Residents should be routinely seeking and performing assessments along with assessments completed by others. For example, residents should be empowered to ask to be directly observed with patients and engage in auditing their own medical records using quality and safety measures.<sup>39</sup> They should, through coaching and conversation, review and synthesize their assessment data to create individualized learning plans.<sup>17,37</sup> This is a major shift for residencies, but will be necessary to not only help ensure family medicine residency graduates are ready for unsupervised practice, but also prepare graduates for ongoing

learning and growth toward expertise and mastery.

## Conclusions

Residency training in family medicine, along with its partner specialties, has been on a 20-year journey to an outcomes-based educational model. The time has come to accelerate the pace of transformational change. This will not be easy, but family medicine can build on its leadership and rich traditions in developing training experiences in the ambulatory setting, incorporating behavioral health into training and patient care, and advancing the skills of practice management, to name just a few.<sup>40-42</sup> Competencies are simply a vehicle, or framework, for defining the educational outcomes essential for effective clinical practice. Love them or hate them, the general competencies have forced all of us to attend to abilities beyond medical knowledge and patient care, such as interprofessional teamwork, quality improvement and patient safety, care coordination, and others. There is no question some of the newer competencies are harder to teach and assess, but that does not make them any less important. CBME is an approach to residency that incorporates a rich tapestry of pedagogical theories, approaches, and empiric research that remains a work-in-progress.

CBME should be continuously refined and informed by ongoing innovation and experimentation until the time a better model arises and can better meet the needs of patients and communities. Box 1 synthesizes some specific recommendations for family medicine to accelerate its shift to outcomes-based education. Ultimately, the GME community will need to demonstrate through rigorous research that CBME can produce both better educational and clinical care outcomes. Given its history, I have little doubt family medicine will be one of the leaders in this ongoing journey of transformation.

## Box 1: Suggestions to Advance CBME in Family Medicine

1. Using the core components framework,<sup>13</sup> delineate the key curricular and programmatic assessment activities needed nationally in family medicine.
2. Support and advance multiinstitutional CBME pilots in family medicine building on past experience and success.<sup>42</sup>
3. Examine and research current assumptions about practice volumes using a developmental- and mastery-based mindset.
4. Implement mastery-based learning approaches in core clinical skills.<sup>2,30</sup>
5. Embrace coproduction as a strategy and educational tool to advance CBME.<sup>38</sup>
6. Work collaboratively within family medicine and with other disciplines to develop and implement new assessment approaches in professionalism, practice-based learning and improvement, and systems-based practice.<sup>34,43</sup>
7. Create a family medicine-specific blueprint for programmatic assessment all residency programs can leverage to improve assessment practices.
8. Invest in the faculty training necessary to improve faculty's own abilities in key clinical competences, feedback, and coaching.<sup>10,17,34,43</sup>

Abbreviation: CBME, competency-based medical education.

**DISCLOSURE:** The author receives royalties from Elsevier for the textbook *Practical Guide to the Evaluation of Clinical Competence, 2nd Edition*.

**CORRESPONDENCE:** Address correspondence to Dr Eric S. Holmboe, Chief Research, Milestones Development and Evaluation Officer, Accreditation Council for Graduate Medical Education, 401 North Michigan Avenue, Chicago, IL 60611. 312-755-7034. eholmboe@acgme.org.

## References

1. McGaghie WC, Miller GE, Sajid AW, Telder TV. Competency-based curriculum development in medical education. Public Health Paper No. 68. Geneva, Switzerland: World Health Organization; 1978.
2. McGaghie WC, Barsuk JH, Wayne DB. Clinical Education: origins and Outcomes. In: McGaghie WC, Barsuk JH, Wayne DB, eds. *Comprehensive Healthcare Simulation: Mastery Learning in Health Professions Education*. Cham, Switzerland: Springer Nature; 2020. doi:10.1007/978-3-030-34811-3\_1
3. Holmboe ES, Batalden P. Achieving the desired transformation: thoughts on next steps for outcomes-based medical education. *Acad Med*. 2015;90(9):1215-1223. doi:10.1097/ACM.0000000000000779
4. Kohn LT, Corrigan J, Donaldson MS. *To Err Is Human: Building a Safer Health System*. Washington, DC: National Academy Press; 2000.
5. Institute of Medicine, Committee on Quality of Health Care in America. *Crossing the quality chasms: a new health system for the 21st century*. Washington: National Academy Press; 2001.
6. James JT. A new, evidence-based estimate of patient harms associated with hospital care. *J Patient Saf*. 2013;9(3):122-128. doi:10.1097/PTS.0b013e3182948a69
7. McGlynn EA, Asch SM, Adams J, Keesey J, Hicks J, DeCristofaro A, Kerr EA. The quality of health care delivered to adults in the United States. 2003; 348(26): 2635-45. doi:10.1056/NEJMSa022615
8. Batalden P, Leach D, Swing S, Dreyfus H, Dreyfus S. General competencies and accreditation in graduate medical education. *Health Aff (Millwood)*. 2002;21(5):103-111. doi:10.1377/hlthaff.21.5.103
9. Hodges BD. A tea-steeping or i-Doc model for medical education? *Acad Med*. 2010;85(9)(suppl):S34-S44. doi:10.1097/ACM.0b013e3181f12f32
10. Wong BM, Holmboe ES. Transforming academic faculty to better align educational and clinical outcomes. *Acad Med*. 2016;91(4):473-479. doi:10.1097/ACM.0000000000001035
11. Thibault GE. The future of health professions education: emerging trends in the United States. *FASEB Bioadv*. 2020;2(12):685-694. doi:10.1096/fba.2020-00061
12. Frank JR, Snell LS, Cate OT, et al. Competency-based medical education: theory to practice. *Med Teach*. 2010;32(8):638-645. doi:10.3109/0142159X.2010.501190
13. Van Melle E, Frank JR, Holmboe ES, Dagnone D, Stockley D, Sherbino J; International Competency-based Medical Education Collaborators. A core components framework for evaluating implementation of competency-based medical education programs. *Acad Med*. 2019;94(7):1002-1009. doi:10.1097/ACM.0000000000002743
14. Govaerts MJB, van der Vleuten CPM, Holmboe ES. Managing tensions in assessment: moving beyond either-or thinking. *Med Educ*. 2019;53(1):64-75. doi:10.1111/medu.13656
15. Ericsson KA. An expert-performance perspective of research on medical expertise: the study of clinical performance. *Med Educ*. 2007;41(12):1124-1130. doi:10.1111/j.1365-2923.2007.02946.x
16. Ericsson KA, Pool R. *Peak: secrets from the new science of expertise*. Boston: Houghton Mifflin Harcourt; 2016.
17. Deiorio NM, Skye E, Sheu L. Introduction and definition of academic coaching. In: *Coaching in Medical Education. A faculty Handbook*. American Medical Association; 2017:chap 1.
18. Dreyfus HL, Dreyfus SE. *Mind over machine: the power of human intuition and expertise in the era of the computer*. New York: Free Press; 1986.
19. Green ML, Aagaard EM, Caverzagie KJ, et al. Charting the road to competence: developmental milestones for internal medicine residency training. *J Grad Med Educ*. 2009;1(1):5-20. doi:10.4300/01.01.0003
20. Nasca TJ, Philibert I, Brigham T, Flynn TC. The next GME accreditation system—rationale and benefits. *N Engl J Med*. 2012;366(11):1051-1056. doi:10.1056/NEJMSr1200117
21. Accreditation Council for Graduate Medical Education. *ACGME Family Medicine Milestones*. <https://www.acgme.org/Portals/0/PDFs/Milestones/FamilyMedicineMilestones.pdf?ver=2020-09-01-150203-400>. Revised October 2018. Accessed November 19, 2020.
22. Peabody MR, O'Neill TR, Peterson LE. Examining the Functioning and Reliability of the Family Medicine Milestones. *J Grad Med Educ*. 2017;9(1):46-53. doi:10.4300/JGME-D-16-00172.1
23. Yaghmour NA, Poulin LJ, Bernabeo EC, et al. Stages of milestones implementation: a template analysis of 16 programs across four specialties. *J Grad Med Educ*. In press.
24. Brydges R, Boyd VA, Tavares W, et al. Assumptions about competency-based medical education and the state of the underlying evidence: a critical narrative review. *Acad Med*. 2021;96(2):296-306.
25. Nousiainen MT, Caverzagie KJ, Ferguson PC, Frank JR, Collaborators ICBME; ICBME Collaborators. Implementing competency-based medical education: what changes in curricular structure and processes are needed? *Med Teach*. 2017;39(6):594-598. doi:10.1080/0142159X.2017.1315077
26. Andrews JS, Bale JF Jr, Soep JB, et al; EPAC Study Group. Education in Pediatrics Across the Continuum (EPAC): First Steps Toward Realizing the Dream of Competency-Based Education. *Acad Med*. 2018;93(3):414-420. doi:10.1097/ACM.0000000000002020
27. Murray KE, Lane JL, Carraccio C, et al; Education in Pediatrics Across the Continuum (EPAC) Study Group. Crossing the gap: using competency-based assessment to determine whether learners are ready for the undergraduate-to-graduate transition. *Acad Med*. 2019;94(3):338-345. doi:10.1097/ACM.0000000000002535



28. Hall AK, Rich J, Dagnone JD, et al. It's a Marathon, Not a Sprint: Rapid Evaluation of Competency-Based Medical Education Program Implementation. *Acad Med.* 2020;95(5):786-793. doi:10.1097/ACM.0000000000003040
29. Lucey CR, Thibault GE, Ten Cate O. Competency-based, time-variable education in the health professions; Crossroads. *Acad Med.* 2018;93(3S Competency-Based, Time-Variable Education in the Health Professions):S1-S5. doi:10.1097/ACM.0000000000002080
30. McGaghie WC, Barsuk JH, Wayne DB. The promise and challenge of mastery learning. *Adv Med Educ Pract.* 2017;8:393-394. doi:10.2147/AMEPS141073
31. Salzman DH, McGaghie WC, Caprio TW, et al. A mastery learning capstone course to teach and assess components of three entrustable professional activities to graduating medical students. *Teach Learn Med.* 2019;31(2):186-194. doi:10.1080/10401334.2018.1526689
32. Accreditation Council for Graduate Medical Education. ACGME Program Requirements for Graduate Medical Education in Family Medicine. [https://www.acgme.org/Portals/0/PFAAssets/ProgramRequirements/120\\_FamilyMedicine\\_2020.pdf](https://www.acgme.org/Portals/0/PFAAssets/ProgramRequirements/120_FamilyMedicine_2020.pdf) Accessed November 21, 2020.
33. van der Vleuten CP, Schuwirth LW, Driessen EW, et al. A model for programmatic assessment fit for purpose. *Med Teach.* 2012;34(3):205-214. doi:10.3109/0142159X.2012.652239
34. Holmboe ES, Iobst WI. *The Assessment Guidebook.* Chicago: ACGME; 2020 <https://www.acgme.org/Portals/0/PDFs/Milestones/Guidebooks/AssessmentGuidebook.pdf?ver=2020-11-18-155141-527>. Accessed February 5, 2021.
35. Ten Cate O. Nuts and bolts of entrustable professional activities. *J Grad Med Educ.* 2013;5(1):157-158. doi:10.4300/JGME-D-12-00380.1
36. Carraccio C, Englander R, Gilhooly J, et al. Building a framework of entrustable professional activities, supported by competencies and milestones, to build a bridge the educational continuum. *Acad Med.* 2017;92(3):324-330. doi:10.1097/ACM.0000000000001141
37. Andolsek K, Padmore J, Hauer KE, Edgar L, Holmboe E. *Clinical Competency Committees. A Guidebook for Programs.* 3rd edition. Chicago: ACGME; 2020. <https://www.acgme.org/Portals/0/ACGMEClinicalCompetencyCommitteeGuidebook.pdf?ver=2020-04-16-121941-380>. Accessed November 19, 2020.
38. Englander R, Holmboe E, Batalden P, et al. Coproducing health professions education: A requisite to coproducing health care service? *Acad Med.* 2020;95(7):1006-1013. doi:10.1097/ACM.00000000000003137
39. Holmboe ES. Work-based assessment and co-production in postgraduate medical training. *GMS J Med Educ.* 2017;34(5):Doc58. doi:10.3205/zma001135
40. Gutierrez C and Schied P. The History of Family Medicine and Its Impact in US Health Care Delivery. <https://www.aafpfoundation.org/content/dam/foundation/documents/who-we-are/cfhm/FMImpactGutierrezScheid.pdf>. Accessed November 18, 2020.
41. Phillips RL Jr, Pugno PA, Saultz JW, et al. Health is primary: family medicine for America's health. *Ann Fam Med.* 2014;12(suppl 1):S1-S12. doi:10.1370/afm.1699
42. Green LA, Jones SM, Fetter G Jr, Pugno PA. Preparing the personal physician for practice: changing family medicine residency training to enable new model practice. *Acad Med.* 2007;82(12):1220-1227. doi:10.1097/ACM.0b013e318159d070
43. Family Medicine Milestones 2.0 Working Group. Supplemental Guide: Family Medicine. <https://www.acgme.org/Portals/0/PDFs/Milestones/FamilyMedicineSupplementalGuide.pdf?ver=2019-12-13-091243-987>. Published October 2019. Accessed February 5, 2021.

## Competency-Based Education in Family Medicine Residency Education

John Saultz, MD

(Fam Med. 2021;53(7):590-2.)

doi: 10.22454/FamMed.2021.816448

Published Online First May 17, 2021

Competency-based medical education (CBME) has become the dominant paradigm in medical schools and residency programs across the United States.<sup>1</sup> The model describes a roadmap for designing educational programs and an underlying philosophy for how teaching and learner evaluation should be done. Eric Holmboe, MD, has done a fine job of reviewing the history of CBME and has described many of the struggles it has encountered.<sup>2</sup> While there is already a rich literature on this topic, much of this work has been published in journals not routinely read by family medicine residency educators.<sup>3-9</sup> Still, this journal has published two papers examining CBME in family medicine residencies within the past year.<sup>10,11</sup> And yet we all struggle with how to make the model work in our own programs as each iteration of the Accreditation Council for Graduate Medical Education (ACGME) Family Medicine Program Requirements moves us farther into new territory. Today, the job of a residency teacher requires an in-depth understanding of CBME and a mastery of the new skills it requires of us.

While the focus of this commentary is on residency education, family medicine residencies are dramatically affected by how CBME is being implemented at the undergraduate level. Medical schools have adopted CBME in diverse ways and this has significantly impacted the skill set of new residents arriving for the first year of training. Over the past 2 decades, scores of new allopathic and osteopathic medical schools have opened,<sup>12,13</sup> often using a highly decentralized model of clinical

training that more closely resembles the model of the Caribbean schools. And each has taken its own approach to competency assessment, often placing responsibility for learner evaluation in the hands of inexperienced community physicians. A careful assessment of entering residents has always been important, but this is now more challenging than ever because the skill levels of students seem more heterogeneous than in the past. In some cases, basic skills are more carefully taught and documented in medical school, but it is also true that students arrive with more variability in their levels of clinical experience. This impacts residency education dramatically, often requiring closer resident supervision and more detailed and frequent assessments of resident progress. Some specialties have taken specific steps to address this problem, such as transition to residency boot camps and warm handoffs between the medical school and residency.<sup>14</sup> While this can be frustrating, it is important to remember why we are doing all this in the first place. Health care in America costs far too much and delivers poor outcomes when compared to other countries. The process of residency education lies at the heart of changing physician performance, and implementing CBME is how we are collectively trying to make things better.

Nevertheless, there are problems with the model itself and with our ability to effectively

---

From the Oregon Health & Science University, Department of Family Medicine, Portland, OR.

implement it in our daily work. The underlying problems with the model include:

1. It is highly dependent on the skills of faculty members to accurately assess learners at the granular level of each residency competency. This, in turn, depends on both the training of the faculty and on the time they have available for this work.
2. It tends to assume that a resident who has achieved every required competency will be both qualified and confident to enter community practice. There is not yet conclusive evidence that this is the case, particularly in a field as broad as family medicine. Our discipline requires astonishing breadth of training compared to narrower fields and it only follows that both competence and confidence are harder to attain and document. Importantly, competence and confidence are not the same thing, and both are essential if we want graduates to conquer their fear of practicing in isolated, low-resource settings. We share this problem with other generalist fields like general surgery and emergency medicine.
3. CBME was introduced to improve the quality and safety of medical practice, but quality and safety are not solely attributes of physician competency. Competent physicians working in dysfunctional systems of care may not be sufficient to deliver measurable system improvement. Certainly, this is why we have a competency domain for systems-based practice, but if the past 20 years have taught us anything, it has shown that physicians no longer control the systems in which we work. This raises the very real question of whether the desired outcomes of CBME can be achieved.
4. CBME requires us to agree what a competent family physician should be trained to do, and our discipline has struggled to come to agreement about this for over 50 years.

In addition to these and other problems with the model itself, there are real problems with its implementation in family medicine residencies. Consider the following:

1. A majority of family medicine programs are in community hospital settings, often where they are the only residency program. Much can be learned about CBME across medical specialties, but these interdisciplinary experiences are less available in family medicine than in any other discipline.
2. While the accurate and reproducible assessment of family medicine resident competency is a challenge for full-time faculty, developing these new faculty skills is even harder when the assessment is done by practicing community physicians. Family medicine residents still work extensively on rotations with physicians in other specialties, and helping such preceptors to develop skills in competency assessment is a huge challenge.
3. CBME places an enormous responsibility on the faculty who conduct competency assessments, and there are at least three reasons to worry about our ability to pull this off. First, competency assessment appears to be much more time consuming than traditional documentation of rotation completion or procedures performed. But faculty have less time today than in the past, and recent changes to the AC-GME common program requirements are likely to worsen this problem.<sup>15</sup> Second, we need a system to accurately assess faculty competency to perform these assessments and such a system does not yet exist. Third, and perhaps most important, there are real conflicts of interest built into the assessment process. The COVID-19 pandemic has clearly demonstrated that the United States desperately needs physicians on the front lines. So the financial and political pressure to get new physicians out the door is substantial. In a worst-case scenario, we risk lowering our educational standards in the interest of expediency even as we try to raise the bar.

CBME is clearly here to stay. As a result, we face a substantial faculty development challenge; all of us should take this very seriously. The first step must be to reexamine the core competencies of family medicine and define the common characteristics we will expect in all future family physicians, and then, we must hold residencies accountable for producing such physicians. CBME was adopted to make health care safer, but it is far from clear that it can accomplish this without much more fundamental change in how health care is funded and delivered in America. It is not a panacea. In fact, it is a complex model that requires fundamental change in how we do the ongoing work of training family physicians. We can complain about this, or we can embrace the challenge of proving whether or not it actually works in the real world. Most of graduate medical education takes place in large

academic health centers. Family physicians, perhaps more than any other specialty, have always known that such settings are artificial environments. Admittedly, family medicine residencies are also quite different from community practices, but at least they are located in the community and interface with people who are in full-time practice. So, the success or failure of CBME may actually depend on our discipline to demonstrate that it can work in the real world. CBME is not the goal; it is a tool, and the usefulness of tools depends on the skill of those using them.

**CORRESPONDENCE:** Address correspondence to Dr John Saultz, Oregon Health & Science University, Department of Family Medicine, 81 S.W. Sam Jackson Park Road, Mail Code FM, Portland, OR 97239-3098. 503-494-7206. saultz@mac.com.

## References

1. Saultz J. Experience Matters. *Fam Med.* 2021;53(1):7-8. doi:10.22454/FamMed.2021.572008
2. Holmboe ES. Competency-based medical education in family medicine. *Fam Med.* 2021;53(7):583-589.
3. Mann KV. Theoretical perspectives in medical education: past experience and future possibilities. *Med Educ.* 2011;45(1):60-68. doi:10.1111/j.1365-2923.2010.03757.x
4. Ten Cate O. Competency-based postgraduate medical education: past, present, and future. *GMS J Med Educ.* 2017;34(5):Doc69.
5. Holmboe ES. Competency-based medical education and the ghost of Kuhn: reflections on the messy and meaningful work of transformation. *Acad Med.* 2018;93(3):350-353. doi:10.1097/ACM.0000000000001866
6. Holmboe ES. Realizing the promise of competency-based medical education. *Acad Med.* 2015;90(4):411-413. doi:10.1097/ACM.0000000000000515
7. Williams RG, Dunnington GL, Mellinger JD, Klamen DL. Placing constraints on the use of the ACGME milestones: a commentary on the limitations of global performance ratings. *Acad Med.* 2015;90(4):404-407. doi:10.1097/ACM.0000000000000507
8. Schultz K, Griffiths J. Implementing competency-based medical education in a postgraduate family medicine residency training program: a stepwise approach, facilitating factors, and process of steps that would have been helpful. *Acad Med.* 2016;91(5):685-689. doi:10.1097/ACM.0000000000001066
9. Williams RG, Dunnington GL, Mellinger JD, Klamen DL. Placing constraints on the use of the ACGME milestones: a commentary on the limitations of global performance ratings. *Acad Med.* 2015;90(4):404-407. doi:10.1097/ACM.0000000000000507
10. Campbell C, Hendry P, Delva D, Danilovich N, Kitto S. Implementing competency-based medical education in family medicine: a scoping review on residency programs and family practices in Canada and the United States. *Fam Med.* 2020;52(4):246-254. doi:10.22454/FamMed.2020.594402
11. Danilovich N, Kitto S, Price DW, Campbell C, Hodgson A, Hendry P. Implementing competency-based medical education in family medicine: a narrative review of trends in assessment. *Fam Med.* 2021;53(1):9-22. doi:10.22454/FamMed.2021.453158
12. Whitcomb ME. The development of new MD-granting medical schools in the United States in the 21st century. *Acad Med.* 2020;95(3):340-343. doi:10.1097/ACM.0000000000003048
13. American Association of Colleges of Osteopathic Medicine. U.S. Colleges of Osteopathic Medicine. <https://www.aacom.org/become-a-doctor/u-s-colleges-of-osteopathic-medicine>. Accessed February 16, 2021.
14. Murphy B. Pre-residency boot camps prep med school grads for new realities. American Medical Association. <https://www.ama-assn.org/residents-students/residency/pre-residency-boot-camps-prep-med-school-grads-new-realities>. Published April 4, 2018. Accessed November 22, 2020.
15. Newton WP, Magill M. The impact of the ACGME's June 2019 changes in residency requirement. *J Am Board Fam Med.* 2020;33(6):1033-1036. doi:10.3122/jabfm.2020.06.200557

## Learning From the Implementation of Milestones

Suzanne Allen, MD, MPH

(Fam Med. 2021;53(7):593-4.)

doi: 10.22454/FamMed.2021.825433

Published Online First May 17, 2021

In 1999, the Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Medical Specialties (ABMS) adopted six core competencies—patient care, medical knowledge, systems-based practice, practice-based learning and improvement, professionalism and interpersonal and communication skills—to improve the quality and safety of patient care in medicine. The Outcomes Project was launched in 2001 to help operationalize these core competencies. As residency programs continued to struggle with the core competencies, the Milestones were developed as part of the Next Accreditation System (NAS) to improve graduate medical education's demonstration of the trajectory of an individual resident's path toward competent, unsupervised practice.<sup>1</sup>

As we think about how to proceed with the next level of competency-based medical education, what can we learn from the implementation of the Milestones? I write from the perspective of the chair of the committee that developed the first version of Milestones and then sat on the Review Committee as they were implemented. Family medicine (FM) began using our Milestones in 2014. A committee with representation across the FM organizations developed the Milestones, received feedback from a broad group of stakeholders, and pilot tested the Milestones before all FM residency programs began using them. Clinical competency committees (CCC) were also introduced as part of the NAS. CCCs review the many different sources of information for each resident and make judgements regarding each resident's progress across the Milestones. At the time FM residency programs began using Milestones and CCCs, there was uncertainty

regarding who should be on the CCCs, what information should be shared with the CCCs, and whether evaluations should change to more closely represent the Milestones.

The Milestones are not competencies. Rather, the Milestones help us have a shared mental model of the trajectory of learning and professional growth in FM. The information needed to make judgements about where learners are on the trajectory of the Milestones include evaluations, assessments of competencies, patient surveys, and clinical data. The ACGME's Milestone website has links to the current FM Milestones, the supplemental guide to the FM Milestones, as well as the *Milestones National Reports* from 2016-2020 and other articles about the Milestones and assessments.<sup>2</sup> The *Milestones National Reports* include benchmarking data for FM and all other specialties.

The Milestones have forced FM educators to have conversations through the CCCs about the multiple sources of information collected regarding each individual resident. As a specialty, we have worked together, taught one another, and shared best practices regarding the CCCs and completing the Milestones. Because of this, FM, unlike other specialties, has not used straight-lining based on the year a resident is in training to complete the Milestones. Straight-lining is defined in the *Milestones National Report* as a string of identical Milestones ratings for a learner across all subcompetencies within that specialty.<sup>3</sup> In the 2020 *Milestones National Report*, FM residency programs showed straight-lining in only 8.3% of PGY-1, 4.5% of PGY-2, and 5.6% of

---

From the Department of Family Medicine, University of Washington School of Medicine, Seattle, WA.

PGY-3 Milestones (range for straight-lining for all specialties 0.0%–50.0%).<sup>4</sup> Completing the Milestones twice per year has helped programs identify individual residents who are struggling globally or in a specific area earlier in residency. This process has also helped programs identify areas where the curriculum of the residency program may need to be changed or improved for all residents in their program.

The Milestones have also shown FM residency programs and educators where challenges remain. For instance, evaluations being completed by faculty do not always provide specific enough information for the CCC to draw conclusions regarding a resident's progress. The assessments programs use do not always accurately assess the competencies. Faculty have not all been trained to teach competencies, provide feedback in a learner-centered way, complete evaluations or do assessments in ways that help residents move along the trajectory towards competent, unsupervised practice. For the Milestones to accurately show a resident's trajectory, the multiple sources of information used to make judgements about resident progress in the Milestones must be appropriate, accurate, and contain useful information to help residents maximize their professional growth.

FM educators can also strengthen and improve education in our residency programs through the use of data. The aggregate data shared in the *Milestones National Report* can help the specialty understand where we are behind in training our residents compared to other specialties in the common competencies of systems-based practice, practice-based learning and improvement, professionalism, and interpersonal and communication skills. We should reach out to our colleagues in other specialties to learn best practices to help improve FM residency education.

As FM residency education continues to embrace competency-based education, faculty development in assessment of the competencies, appropriate completion of evaluations, interpretation of other pertinent data, and educating residents and fellows about their own learning and professional growth trajectory is important. We must collaborate by sharing best practices and ensuring all faculty have been trained to use this system. FM residency program directors must also be trained to utilize program and national data from the Milestones to improve the education and assessments for the program, and we as a specialty must do the same.

The Milestones are not designed to be forgotten at the end of residency. The trajectory of the Milestones is not designed for graduating residents to be experts in all competencies. All practicing physicians should continue their professional growth trajectories toward being experts. Family physicians can continue using the Milestones to help develop individual learning plans for continued professional growth and development throughout their careers.

This work is important. Moving to competency-based education and assessment requires us to have goals and specific outcomes to measure our success. After 5 years of work, FM residencies have learned to teach and assess competencies. To complete this process, it will take dedicated time for faculty and program directors to develop and implement competency-based teaching and assessment. We can accomplish this goal.

Family physicians care for all ages of individuals, in urban, suburban, small city and rural communities across the United States. FM has a responsibility to train and graduate family physicians ready to provide competent, unsupervised care, and who will continue their learning and professional growth to provide high-quality, safe care to their community.

**CORRESPONDENCE:** Address correspondence to Dr Suzanne Allen, Clinical Professor, Department of Family Medicine, University of Washington School of Medicine, 1959 NE Pacific Street, Health Sciences Building, A352A, Box 356340, Seattle, WA 98195. 208-364-4552. Fax: 208-364-2344. suzaalle@uw.edu.

## References

1. Edgar L, McLean S, Hogan SO, Hamstra S, Holmboe ES. ACGME Milestones Guidebook. <https://www.acgme.org/Portals/0/MilestonesGuidebook.pdf>. Accessed February 20, 2021.
2. Accreditation Council for Graduate Medical Education. Milestones. <https://acgme.org/specialties/milestones/pfcatid>. Accessed February 27, 2021.
3. Edgar L, Hamstra S, Hogan S, et al. ACGME 2020 Milestones National Report. p. 10. <https://acgme.org/Portals/0/PDFs/Milestones/2020%20Milestones%20National%20Report%20Final.pdf?ver=2020-12-22-154157-390>. Accessed March 14, 2021.
4. Edgar L, Hamstra S, Hogan S, et al. ACGME 2020 Milestones National Report. p. 23. <https://acgme.org/Portals/0/PDFs/Milestones/2020%20Milestones%20National%20Report%20Final.pdf?ver=2020-12-22-154157-390>. Accessed March 14, 2021.

## The Evolution of Residency Training in Family Medicine: A Canadian Perspective

Nancy Fowler, MD, CCFP; Francine Lemire, MD, CM, CCFP, CAE, ICD.D; Ivy Oandasan, MD, CCFP, MHS; Roy Wyman, MD, CCFP

(Fam Med. 2021;53(7):595-8.)

doi: 10.22454/FamMed.2021.718541

Published Online First May 17, 2021

**B**oth Canada and the United States are in the process of reviewing residency training in family medicine. This commentary examines the College of Family Physicians of Canada's experience with competency-based medical education and length of training decisions as both countries grapple with how best to ensure that training keeps pace with societal needs.

In Canada, we are nearing completion of the College of Family Physicians of Canada's (CFPC) Outcomes of Training Project, a national reflection on residency training that is leading us to pursue a longer training period.<sup>1,2</sup> This will be no small feat to accomplish. Most interesting perhaps is how we got here—our experience with competency-based medical education (CBME) and what we might learn from each other as the United States embarks on a similar process of residency review.

At 2 years in length, Canada has the shortest family medicine residency training in the developed world. We share a commitment with the United States to prepare graduates for a full scope of practice that includes hospital, emergency, and maternal-child (including intrapartum) care. Our family physicians serve a highly diverse population and vast geography where almost 20% of the population lives in a rural or remote environment, including indigenous peoples deeply impacted by colonization and systemic racism.<sup>3,4</sup> This is the broadest training mandate in the developed world, matched only by Australia's rural stream.

### What Is Our Story?

In 2010 the CFPC introduced CBME via a reform called the "Triple-C Competency based Curriculum" (Triple C). This reform focused on **C**omprehensiveness, **C**ontinuity, and **a**uthentic family medicine learning environments (**C**entered in family medicine), together with transformed workplace-based competency assessment.<sup>5,6</sup> Competence in family medicine was defined by the Canadian Medical Education Directives for Specialists (CanMEDs)-Family Medicine competency framework adapted for family medicine and organized around seven physician roles: expert, communicator, collaborator, leader, professional, advocate, scholar.<sup>7</sup> Assessment benchmarks referred to as the Evaluation Objectives (now Assessment Objectives) were created to guide certification decisions.<sup>8</sup>

Social accountability was the main motivation for introducing Triple C. Originally defined by the World Health Organization in 1995 as "the obligation to direct education, research, and service activities towards addressing the priority health concerns of the community, region and/or nation they have a mandate to serve," social accountability is a value firmly entrenched in Canadian medical schools and

---

From the College of Family Physicians of Canada (Drs Fowler, Lemire, Oandasan, and Wyman); Department of Family Medicine, McMaster University (Dr Fowler); and Department of Family & Community Medicine, University of Toronto (Drs Lemire, Oandasan, and Wyman).

codified in both undergraduate and postgraduate accreditation standards.<sup>9,10</sup>

The CFPC's assertion was that an enhanced commitment to competence would attract and ensure graduates who are fully able (and therefore willing) to take up the task of comprehensive care in our many and diverse environments. A logic model was established with a defined theory of change and anticipated set of outcomes.<sup>5</sup> This was supported by programmatic evaluation, and a national Family Medicine Longitudinal Resident Survey (FMLS) was established to follow learners' educational experiences, career intentions and actual choices at three intervals through training and into practice. This data allows a critical examination of Triple C implementation and its impact.

### Where Are We 10 Years Later?

There have been many successes, and residency programs are collectively much stronger as a result. Improved workplace-based assessments focusing on direct observation with feedback and guided reflection has resulted in timelier, more learner-centered educational remediation.<sup>11,12</sup> Triple C transformed residency programs – empowering them to take charge of curricula and elevating the role of family practice teachers. This cultivated a sense of ownership, professional identity, purpose, and enthusiasm within the family medicine teaching community and spawned a generation of educational leaders.<sup>13</sup>

Despite these important accomplishments, CBME does not appear to have moved the needle on our social accountability goals. Rural, indigenous, and inner-city populations are still underserved, with a maldistribution of family physicians and the scopes of practice and practice intentions of our graduates continuing to narrow.<sup>14</sup> Program directors tell us that the “curriculum is full” and so capacity is limited to respond educationally to the many challenges and changes we face as a society.

### Lessons Learned?

Based upon Triple C program evaluation, we learned that residency programs did not have a clear understanding of how comprehensive care was being defined and specifically what graduates were expected to be able to do across the broad scope of family medicine by the end of residency. This led to some inconsistencies across programs.<sup>13</sup> As our experience with CBME deepens, we observe that competence, while necessary, may be insufficient on

its own to ensure preparedness and uptake of comprehensive practice. What else is required? Family physician colleagues have talked to us about the role that confidence and self-concept play in professional identity formation and career decision-making. We want to better define adaptability for family medicine and to deepen our understanding of the educational conditions that support adaptability and adaptive expertise in our learners.<sup>15</sup> Our rural colleagues have introduced us to the term “clinical courage” pushing us as generalists to think more about what is required to function beyond the comfortable limits of our certainty or competence.<sup>16</sup>

A Theory of Planned Behavior analysis of family medicine residents' career intentions suggests that perceived social norms of practice have a significant influence and so we recognize that the community of practice that surrounds each resident is as important as what we teach in the formal curriculum.<sup>17</sup> There are social and market forces far more powerful than the training experience itself in shaping residents career choices and this forces us to discern how and where we can have an impact. Where do we go from here?

Through the Outcomes of Training Project, we have yet-unpublished data showing that many graduates do not feel prepared for clinical activities outside the office-based primary care setting and this is reactivating our long-standing debate about the length of training. In a CBME paradigm time is considered a resource rather than a metric for learning, a weak proxy for experience.<sup>18</sup> How much resource we require will depend on our goals and this has forced us to reexamine our role(s) as family physicians, and to articulate our intended training outcomes with a clearer link between education and practice. This is the logic behind the CFPC's development of the *Family Medicine Professional Profile* (FMPP) released in 2018.<sup>19</sup> The FMPP is a job description of sorts, defining our collective commitment to a comprehensive scope of practice as well as our care philosophy and interdependent work arrangements such as the Patient Medical Home.<sup>20</sup> The FMPP has been elaborated for training purposes into a Residency Training Profile (RTP) detailing the expectations/scope of training through a set of Core Professional Activities (CPAs) that are brought to life in a series of Practice Narratives assembled from field research done with family physicians.



Both countries face dynamic health care trends with practice and training implications: new technologies and therapeutics, an aging population, complex care needs including an opioid crisis, dehospitalization and shorter stays intensifying community care demands, interprofessional care models, and now, of course a pandemic. These increased demands on education come at a time when, for all good reasons, resident duty hours are reduced. Just prior to the pandemic, the issue of physician burnout was on everybody's lips with various root cause analyses and a sense that narrowing our scope has deskilled us, shrinking our horizons and leading to demoralization and/or a feeling of dislocation.<sup>21</sup>

The CFPC is engaged in an ongoing and iterative attempt to “get to better,” defining and using outcomes evaluation as an important tool in the process. Detailing the expected scope of training has made it much easier to identify that we are seriously underresourced. And so, our next educational chapter focuses on the length and scope of training in the larger pursuit of social accountability. Although some decision makers prefer to think of community needs as primary, secondary, or tertiary care, we prefer to position our contribution in terms of proximity care—we commit to a person and to meeting their needs wherever they are, using all means available to us, including collaboration and innovative technologies.<sup>22</sup> Ongoing medical education renewal is a necessary but insufficient ingredient to an improved delivery of community-based care. It must be accompanied by policies and remuneration models that support comprehensiveness and a broad scope of practice, rather than incentivized episodic care. This represents a big task, for which the time has come. The status quo is no longer an option for us.

**FINANCIAL SUPPORT:** The Outcomes of Training Project cited in this article is fully funded by the College of Family Physicians of Canada.

**CONFLICT OF INTEREST STATEMENT:** All four authors are paid employees of the College of Family Physicians of Canada. The authors have no other potential professional or personal conflicts of interest to declare.

**CORRESPONDING AUTHOR:** Address correspondence to Dr Nancy Fowler, College of Family Physicians of Canada, 2630 Skymark Avenue, Mississauga, ON, Canada L4W 5A4. 905-629-0900. nfowler@cfpc.ca.

## References

1. Lemire F, Fowler N. Linking education and practice: The Outcomes of Training project. *Can Fam Physician*. 2018;64(11):866.
2. Sawchuk P. Outcomes of Training: preparing for the future. *Can Fam Physician*. 2019;65(4):301.
3. Advancing Rural Family Medicine: The Canadian Collaborative Taskforce. The Rural Road Map for Action – Directions. Mississauga, ON: Advancing Rural Family Medicine: The Canadian Collaborative Taskforce; 2017. [https://portal.cfpc.ca/ResourcesDocs/uploadedFiles/Directories/Committees\\_List/Rural%20Road%20Map%20Directions%20ENG.pdf](https://portal.cfpc.ca/ResourcesDocs/uploadedFiles/Directories/Committees_List/Rural%20Road%20Map%20Directions%20ENG.pdf). Accessed February 26, 2021.
4. Indigenous Health Working Group of the College of Family Physicians of Canada and Indigenous Physicians Association of Canada. Health and Health Care Implications of Systemic Racism on Indigenous Peoples in Canada. Mississauga, ON: College of Family Physicians of Canada; 2016. [https://portal.cfpc.ca/ResourcesDocs/uploadedFiles/Resources/\\_PDFs/SystemicRacism\\_ENG.pdf](https://portal.cfpc.ca/ResourcesDocs/uploadedFiles/Resources/_PDFs/SystemicRacism_ENG.pdf). Accessed February 26, 2021.
5. Tannenbaum D, Kerr J, Konkin J, 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. [https://portal.cfpc.ca/resourcesdocs/uploadedFiles/Education/\\_PDFs/WGCR\\_TripleC\\_Report\\_English\\_Final\\_18Mar11.pdf](https://portal.cfpc.ca/resourcesdocs/uploadedFiles/Education/_PDFs/WGCR_TripleC_Report_English_Final_18Mar11.pdf). Accessed February 20, 2021.
6. Oandasan I, Saucier D, eds. Triple C Competency-based Curriculum Report—Part 2: advancing implementation. Mississauga, ON: College of Family Physicians of Canada; 2013. [https://portal.cfpc.ca/resourcesdocs/uploadedFiles/Education/\\_PDFs/TripleC\\_Report\\_pt2.pdf](https://portal.cfpc.ca/resourcesdocs/uploadedFiles/Education/_PDFs/TripleC_Report_pt2.pdf). Accessed February 20, 2021.
7. Shaw E, Oandasan I, Fowler N, eds. CanMEDS-FM 2017: A competency framework for family physicians across the continuum. Mississauga, ON: The College of Family Physicians of Canada; 2017. [https://portal.cfpc.ca/resourcesdocs/uploadedFiles/Resources/Resource\\_Items/Health\\_Professionals/CanMEDS-Family-Medicine-2017-ENG.pdf](https://portal.cfpc.ca/resourcesdocs/uploadedFiles/Resources/Resource_Items/Health_Professionals/CanMEDS-Family-Medicine-2017-ENG.pdf). Accessed February 20, 2021.
8. Crichton T, Schultz K, Lawrence K, et al. Assessment Objectives for Certification in Family Medicine. Mississauga, ON: College of Family Physicians of Canada; 2020. [https://portal.cfpc.ca/ResourcesDocs/uploadedFiles/Education/Certification\\_in\\_Family\\_Medicine\\_Examination/Assessment-Objectives-for-Certification-in-FM-full-document.pdf](https://portal.cfpc.ca/ResourcesDocs/uploadedFiles/Education/Certification_in_Family_Medicine_Examination/Assessment-Objectives-for-Certification-in-FM-full-document.pdf). Accessed February 20, 2021.
9. Boelen C, Heck JE. Defining and Measuring the Social Accountability of Medical Schools. Geneva, Switzerland: World Health Organization; 2015. [http://apps.who.int/iris/bitstream/10665/59441/1/WHO\\_HRH\\_95.7.pdf](http://apps.who.int/iris/bitstream/10665/59441/1/WHO_HRH_95.7.pdf). Accessed February 20, 2021.
10. Rourke J. Social Accountability: A framework for medical schools to improve the health of the populations they serve. *Acad Med*. 2018;93(8):1120-1124. doi:10.1097/ACM.0000000000002239
11. Ross S, Binczyk NM, Hamza DM, et al. Association of a competency-based assessment system with identification of and support for medical residents in difficulty. *JAMA Netw Open*. 2018;1(7):e184581. doi:10.1001/jamanetworkopen.2018.4581
12. Lawrence K, Van der Goes T, Crichton T, et al. Continuous Reflective Assessment for Training (CRAFT): A national programmatic assessment model for family medicine. Mississauga, ON: College of Family Physicians of Canada; 2018. [https://portal.cfpc.ca/ResourcesDocs/uploadedFiles/About\\_Us/CRAFT\\_ENG\\_Final\\_Aug27.pdf](https://portal.cfpc.ca/ResourcesDocs/uploadedFiles/About_Us/CRAFT_ENG_Final_Aug27.pdf). Accessed February 20, 2021.

13. Ellaway RH, Palacios Mackay M, Lee S, et al. The impact of a national competency-based medical education initiative in family medicine. *Acad Med.* 2018;93(12):1850-1857. doi:10.1097/ACM.0000000000002387
14. Weidner AKH, Chen FM. Changes in preparation and practice patterns among new family physicians. *Ann Fam Med.* 2019;17(1):46-48. doi:10.1370/afm.2337
15. Mylopoulos M, Kulasegaram K, Woods NN. Developing the experts we need: fostering adaptive expertise through education. *J Eval Clin Pract.* 2018;24(3):674-677. doi:10.1111/jep.12905. Accessed February 23, 2021.
16. College of Family Physicians of Canada. Priority Topics for the Assessment of Competence in Rural and Remote Family Medicine. Mississauga, ON: College of Family Physicians of Canada; 2018. [https://portal.cfpc.ca/ResourcesDocs/uploadedfiles/Education/Rural-PT\\_KF\\_EN.pdf](https://portal.cfpc.ca/ResourcesDocs/uploadedfiles/Education/Rural-PT_KF_EN.pdf). Accessed March 24, 2021.
17. Grierson LE, Fowler N, Kwan MY. Family medicine residents' practice intentions: theory of planned behaviour evaluation. *Can Fam Physician.* 2015;61(11):e524-e531.
18. Holmboe ES, Sherbino J, Englander R, Snell L, Frank JR; ICBME Collaborators. A call to action: The controversy of and rationale for competency-based medical education. *Med Teach.* 2017 Jun;39(6):574-581. doi:10.1080/0142159X.2017.1315067.
19. College of Family Physicians of Canada. Family Medicine Professional Profile. Mississauga, ON: College of Family Physicians of Canada; 2018. [https://portal.cfpc.ca/resourcesdocs/uploadedFiles/About\\_Us/FM-Professional-Profile.pdf](https://portal.cfpc.ca/resourcesdocs/uploadedFiles/About_Us/FM-Professional-Profile.pdf). Accessed March 24, 2021.
20. Weidner AKH, Phillips RL Jr, Fang B, Peterson LE. Burnout and scope of practice in new family physicians. *Ann Fam Med.* 2018;16(3):200-205. doi:10.1370/afm.2221
21. College of Family Physicians of Canada. A new vision for Canada: Family Practice—The Patient's Medical Home 2019. Mississauga, ON: College of Family Physicians of Canada; 2019. [https://patientsmedicalhome.ca/files/uploads/PMH\\_VISION2019\\_ENG\\_WEB\\_2.pdf](https://patientsmedicalhome.ca/files/uploads/PMH_VISION2019_ENG_WEB_2.pdf). Accessed March 24, 2021.
22. Beaulieu MD. The perils and the promise of proximity: Dr Ian McWhinney Lecture, 2016. *Can Fam Physician.* 2016;62(12):964-968.

## The Case for the 4-Year Residency in Family Medicine

Alan B. Douglass, MD

(Fam Med. 2021;53(7):599-602.)

doi: 10.22454/FamMed.2021.750646

Published Online First May 26, 2021

Family medicine residency programs are tasked with training physicians capable of, as the Millis Commission put it in 1966, “highly competent provision of comprehensive and continuing medical services.”<sup>1</sup> However, due to ever-increasing complexity of care and reductions in training time, the ability of programs to deliver on this task is increasingly stressed. The optimal length of training has been debated since the specialty’s inception, with recognition of the need for curricular flexibility and that training could take up to 4 years to complete.<sup>2</sup>

In 2004 the Future of Family Medicine report called for residency innovation.<sup>3</sup> Beginning in 2006 the P4 Project facilitated 14 programs modeling diverse changes in curriculum design and training length.<sup>4</sup> Middlesex Health implemented the first required 4-year curriculum in 2007.<sup>5</sup> Several optional 4-year models were also developed. In 2012 the Accreditation Council on Graduate Medical Education (ACGME) Length of Training Pilot, a prospective case-control study of the 4-year residency, was initiated and is currently reporting findings.<sup>6</sup>

### What Is a 4-Year Residency?

A 4-year residency is a substantially enhanced training experience.<sup>7</sup> It contains all the core components of a 3-year program with three significant additions. First is an enhanced core curriculum with 6 additional months of required experiences in areas of particular need such as care of children, practice and health system management, and population health. Second is an area of individual concentration (AOC) consisting of 6 months of immersion in a specific area of passion or anticipated

practice need such as maternal-child health, academics, or behavioral health. Finally, residents receive enhanced continuity experience with up to 50% additional clinical encounters in all areas of family medicine (Table 1). This basic model can be implemented in a variety of approaches and settings based on program focus and community need.

### The Case for 4 Years

#### *There Is More to Teach*

The fundamental structure of family medicine training has not changed since 1968. However, to meet escalating societal needs family physicians must now have substantially more expertise. Complexity of care is increasing, and diagnostic and therapeutic modalities are proliferating. Today’s family physicians must be competent in many areas not envisioned 50 years ago, including health information management, population health, HIV care, point-of-care ultrasound, management of teams within complex health systems, telemedicine, genomics, medication-assisted treatment of addiction, leadership, and advocacy.

#### *Training Time is Decreasing*

The 2003 implementation of ACGME duty hours led to a substantial reduction in training time. While an important advance, the 2020 American Board of Family Medicine family leave guidelines remove up to an additional 8 weeks of training. Any serious future efforts to promote trainee wellness will reduce training even further.

---

From the Middlesex Health Family Medicine Residency Program, and the University of Connecticut and Quinnipiac University Schools of Medicine.

**Table 1: Clinical Encounters in 3- and 4-Year Residency Programs**

	ACGME Minimum*	3-Year Model Average**	4-Year Model Average***
Core curricular months	33	Data not available	42
Elective study months	3	Data not available	11
Continuity encounters	1,650	1,800	2,500
Continuity encounters <age 10 years	165	Data not available	270
Adult inpatient encounters	750	Data not available	1,500
Newborn encounters	40	Data not available	140
OB nontrack deliveries	None	42	80
OB track deliveries	None	Data not available	260

\*ACGME Program Requirements in Family Medicine effective July 1, 2020.

\*\*ACGME Web Accreditation Data System (WebADS) data

\*\*\*Source: Personal communication, Wendy Barr, MD, MPH, MSCE; Joe Skaria, DO, MPH, MBA; Kelly Hill, MD; and Dan Casey, MD, MS.

Programs are increasingly struggling to fit even basic requirements into 3 years, with continuity visits declining. Both residents and program directors feel medical school graduates are not adequately prepared for residency,<sup>8,9</sup> a trend exacerbated by the COVID-19 pandemic. Residents are less confident in their preparation to enter practice, with 17% planning a fellowship and another 20% considering it.<sup>10</sup>

Some argue that wide implementation of competency-based education could deliver more efficient training and create needed curricular space within the existing 3-year model. However, there is no substitute for substantial experience in developing competence and confidence. Reducing it will only exacerbate current trends.

#### *Scope of Practice Is Eroding*

Broad scope is a defining characteristic of family medicine, and a key student attraction to the discipline. However, care of children, maternity care, and procedures are all declining as need is increasing, particularly in rural and other low-resource areas. Broader scope is associated with higher levels of medical knowledge,<sup>11</sup> lower levels of burnout,<sup>12</sup> higher levels of job satisfaction,<sup>13</sup> and lower costs of care.<sup>14</sup> If scope continues to narrow it will be increasingly difficult to distinguish ourselves, at least in the eyes of some, from the large numbers of physician assistants and nurse practitioners entering the primary care workforce.

#### *Residents Want Choice*

Additional individualized training to achieve broader scope is difficult to achieve in the

increasingly constrained 3-year model. Robust AOCs are in effect structured longitudinal fellowships integrated in parallel with ongoing generalist training. They are educationally ideal for physicians planning generalist practice, and much more than an aggregation of a few months of electives. They can also provide advanced degrees. Completion of an AOC is associated with broader scope of practice,<sup>15</sup> while stand-alone fellowships are associated with more focused scope. Production of family physicians with additional expertise is particularly important in maternity care and academics, both critical to our discipline's future.

#### *We Must Preserve the Ability to Innovate*

If family medicine is to maintain its position as the lead primary care specialty we must preserve the ability to innovate in response to new challenges, and train future leaders in health care transformation. However, lack of available training time stifles any opportunity for widespread curricular innovation. Further, many residency offices have fallen behind industry best practices and are no longer aspirational innovative spaces.

#### *Both Students and Programs Are Interested*

Family medicine has the broadest scope yet the shortest duration of training of any US specialty, and other than Canada, the shortest in the developed world. Many students are skeptical they can acquire breadth and feel both competent and confident in less time than narrower specialties. Family medicine must appear

attractive if we are to match more than 8% of US medical graduates.

At least one-third of students view 4-year curricula positively.<sup>16</sup> Forty-eight percent of Family medicine residents expressed interest in a fourth year of training if it were available.<sup>17</sup> Applicant pool and match performance are unaffected by extended duration of training.<sup>18</sup> Required 4-year programs report dramatic growth in both volume and quality of applications, with a 62% increase in US applicants per offered position between 2014 and 2020 (Personal communication, Wendy Barr, MD, MPH, MSCE).

There is also substantial interest among programs. Twenty-five percent of faculty feel the optimal duration of required training should be 4 years<sup>19</sup>; 34% of current 3-year directors would consider converting their program to 4 years if financial barriers were removed, while 16% would convert regardless if permitted by the ACGME (CERA Survey data, personal communication, Wendy Barr, MD, MPH, MSCE).

#### *Four Years Is Financially Feasible*

From a program perspective, adding a fourth year requires resident salary support plus variable amounts of additional faculty and operational expenses. Additional revenue can come from a variety of sources. Fourth-year resident professional fees typically cover resident direct expenses. If under cap, a fourth year of training in family medicine receives only 50% of federal direct medical education funding, but more lucrative indirect medical education support remains intact. Teaching health center funding, health system partnerships, and institutional support are all available sources of additional revenue. All required 4-year programs have demonstrated sustainable funding in a variety of models, maintaining or improving their contribution margins to their sponsoring institutions.<sup>20</sup>

From a resident perspective there is an intrinsic economic trade-off between a fourth year of resident salary (\$75,000) and an additional year of practice income (\$215,000). Choosing a fourth year therefore appears to carry an opportunity cost of \$140,000. However, once marginal tax brackets are accounted for, the increment shrinks to \$93,000. Four-year graduates possess unique attributes

that are highly valued by employers and provide the opportunity to quickly defray this increment. Additional clinical experience and broader scope facilitate higher levels of early practice productivity. Four-year graduates are also prepared to assume more highly compensated leadership roles earlier in their careers.

#### **Conclusions**

Family medicine is the specialty with the broadest scope but shortest training time. Training is currently being eroded from both ends with more to learn and less time to learn it. Scope of practice is diminishing and threatening our identity and differentiation from other primary care clinicians. These constraints are limiting our ability to be innovators and primary care leaders. Students want to graduate competent and confident, but are increasingly skeptical that they can acquire either in the current model. Four years of training is not a deterrent to entering family medicine, but 3 years may soon be. As we consider the future of training over the next decade, now is the time to bolster training, not reduce it.

The 4-year residency provides a flexible solution to all these challenges. It is both practically and financially feasible, and sought by increasing numbers of applicants and programs. It would be a serious mistake for our discipline to eliminate this option. To do so would commit family medicine to an increasingly confining curricular box and continued decline in scope of practice.

#### **Recommendation**

The family medicine community should advocate to the ACGME to preserve the opportunity for interested programs to continue in or transition to a 4-year model in response to their training goals and community needs. This would provide the discipline with needed flexibility to address current curricular constraints, maintain broad scope of practice, and innovate in response to future challenges.

**CORRESPONDENCE:** Address correspondence to Dr Alan B. Douglass, Director, Middlesex Health Family Medicine Residency Program, 90 South Main Street, Middletown, CT 06457. 860-358-6305. Alan.douglass@midhosp.org.

#### **References**

1. Millis Commission. The graduate education of physicians: the Report of the Citizens Commission on Graduate Medical Education. Chicago: American Medical Association; 1966.

2. Carek PJ, Anim T, Conry C, et al. Residency training in family medicine: a history of innovation and program support. *Fam Med.* 2017;49(4):275-281.
3. Bucholtz JR, Matheny SC, Pugno PA, David A, Bliss EB, Korin EC. Task Force Report 2. Report of the Task Force on Medical Education. *Ann Fam Med.* 2004;2(suppl 1):s51-s64. doi:10.1370/afm.135
4. Carney PA, Eiff MP, Waller E, Jones SM, Green LA. Redesigning residency training: summary findings from the Preparing the Personal Physician for Practice (P4) project. *Fam Med.* 2018;50(7):503-517. doi:10.22454/FamMed.2018.829131
5. Douglass AB, Rosener SE, Stehney MA. Implementation and preliminary outcomes of the nation's first comprehensive 4-year residency in family medicine. *Fam Med.* 2011;43(7):510-513.
6. Carek PJ. The length of training pilot: does anyone really know what time it takes? *Fam Med.* 2013;45(3):171-172.
7. Pugno PA. One giant leap for family medicine: preparing the 21st-century physician to practice patient-centered, high-performance family medicine. *J Am Board Fam Med.* 2010;23(suppl 1):S23-S27. doi:10.3122/jabfm.2010.S1.090291
8. Engelhardt KE, Bilimoria KY, Johnson JK, et al. A national mixed-methods evaluation of preparedness for general surgery residency and the association with resident burnout. *JAMA Surg.* 2020;155(9):851-859. doi:10.1001/jamasurg.2020.2420
9. Lyss-Lerman P, Teherani A, Aagaard E, Loeser H, Cooke M, Harper GM. What training is needed in the fourth year of medical school? Views of residency program directors. *Acad Med.* 2009;84(7):823-829. doi:10.1097/ACM.0b013e3181a82426
10. Sairenji T, Dai M, Eden AR, Peterson LE, Mainous AG III. Fellowship or further training for family medicine residents? *Fam Med.* 2017;49(8):618-621.
11. Peterson LE, Blackburn B, Peabody M, O'Neill TR. Family physicians' scope of practice and American Board of Family Medicine recertification examination performance. *J Am Board Fam Med.* 2015;28(2):265-270. doi:10.3122/jabfm.2015.02.140202
12. Weidner AKH, Phillips RL Jr, Fang B, Peterson LE. Burnout and scope of practice in new family physicians. *Ann Fam Med.* 2018;16(3):200-205. doi:10.1370/afm.2221
13. Rivet C, Ryan B, Stewart M. Hands on: is there an association between doing procedures and job satisfaction?. *Can Fam Physician.* 2007;53(1):92-93.
14. Bazemore A, Petterson S, Peterson LE, Phillips RL Jr. More comprehensive care among family physicians is associated with lower costs and fewer hospitalizations. *Ann Fam Med.* 2015;13(3):206-213. doi:10.1370/afm.1787
15. Eiff MP, Hollander-Rodriguez J, Skariah J, et al. Scope of practice among recent family medicine residency graduates. *Fam Med.* 2017;49(8):607-617.
16. Duane M, Dovey SM, Klein LS, Green LA. Follow-up on family practice residents' perspectives on length and content of training. *J Am Board Fam Pract.* 2004;17(5):377-383. doi:10.3122/jabfm.17.5.377
17. Carney PA, Eiff MP, Waller E, Peterson LE. Factors associated with interest in pursuing a fourth year of family medicine residency training. *Fam Med.* 2017;49(5):339-345.
18. Eiff MP, Ericson A, Uchison EW, et al. A comparison of residency applications and match performance in 3-year vs 4-year family medicine training programs. *Fam Med.* 2019;51(8):641-648. doi:10.22454/FamMed.2019.558529
19. Starfield Summit IV: Re-envisioning Family Medicine Residency Education. <https://residency.starfieldsummit.com/community-dialogue>. Accessed March 27, 2021.
20. Douglass AB, Barr WB, Skariah JM, et al. Financing the fourth year: experiences of required 4-year family medicine residency programs. *Fam Med.* 2021;53(3):195-199. doi:10.22454/FamMed.2021.249809

## The Case for 3 Years of Family Medicine Residency Training

Donald Raj Woolever, MD

(Fam Med. 2021;53(7):603-5.)

doi: 10.22454/FamMed.2021.222197

Published Online First May 26, 2021

**T**he duration of family medicine residency training in the United States has been 3 years since the inception of the discipline in 1969. Family medicine training around the world ranges from 2 to 5 years, with varying approaches to undergraduate and predoctoral education. Much has changed in US medicine since 1969, yet the core values of family medicine have remained consistent. While adjustments in curricula, structure, and sequence may be warranted, 3 years remains the appropriate length of training for family medicine residents. A longer duration of training poses significant challenges at the same time that learners need more choice and flexibility. Innovation in training requires creative thought, reforms, and adaptability, without increasing the length of training.

### Continued Demand for 3 Years of Training

The 3-year family medicine residency experience allows for a graded exposure to key elements of training while also ensuring ready access to care for patients and communities. This is validated by sustained demand for the graduates of 3-year programs and the demand for additional training slots. In 2020, the physician recruiting firm of Merritt Hawkins identified family medicine as “the most in-demand specialty” by employers for 14 consecutive years.<sup>1</sup> The Medical Group Management Association has shown a 15% increase in family physician salaries to a median of \$250,000 for outpatient practice in 2020.<sup>2</sup> At the same time, to meet the demand of trainees, the number of

3-year family medicine residencies has grown at approximately 3.5% per year, adding 99 new programs since 2018.<sup>3</sup>

### Longer Duration of Training Poses Many Challenges

The current infrastructure is built with resources and funding to support 3 years of family medicine residency. Increasing the duration would result in a longer pipeline and a delay in graduating family physicians prepared to serve their communities. A 1-year increase in training would result in approximately 4,500 fewer family medicine graduates. Even if spread over several years, that would represent a significant loss of new graduates at a time when the United States is projected to have a shortage of 55,000 family physicians.<sup>4</sup>

For community-based family medicine residencies, the increase in unfunded requirements and staffing needs of additional training would prove to be a significant burden. At the national average of \$150,000 per year per resident, even small programs could see a large increase in expenses.<sup>5</sup> Although some 4-year programs have reported financial stability, most depend on increased clinical volume or novel funding sources.<sup>6</sup>

Beyond the financial barriers, adequate clinical experiences and patient volumes, along with the concern for availability of clinical faculty, all pose significant hurdles. Accreditation Council for Graduate Medical Education data

---

From the Maine-Dartmouth Family Medicine Residency, Augusta, ME.

already shows declines in the number of continuity visits, pediatric visits, and continuity obstetrical deliveries managed by family medicine residents.<sup>7</sup> Additional teaching needs would further exacerbate the existing challenges of recruiting new faculty to community-based and rural programs.

### Learner Choice and Flexibility

A change in length of training may also result in an overall decrease in the number of medical school seniors seeking family medicine residency positions. The existing structure maintains medical student interest and acknowledges the paradigm of educational debt. The Association of American Medical Colleges reported a median medical student debt burden of \$200,000 in 2020.<sup>8</sup> An increase in residency length would mean a delay to full income potential. Although family medicine salaries have risen steadily, the discipline remains among the lowest paid, and a nearly \$200,000 pay differential between resident and attending physician, balanced against an average \$200,000 educational debt is significant. The path to becoming a physician, already a long and expensive journey, could lead some students to choose a 3-year training program in a different specialty.

### Reform Without Increasing the Length of Training

The discipline should emphasize the quality of training rather than the quantity of time. A recent survey of family medicine faculty and residents showed a clear preference for maintaining 3 years of training with 74% of faculty and 77% of residents preferring 3 years or 3 years with an optional fourth year of training.<sup>9</sup> Longer length of training does not necessarily lead to increased knowledge. A recent study comparing emergency medicine residents in 3- or 4-year programs found no difference in board exam scores.<sup>10</sup>

There is a need for reexploration of the contents of the 3 years of family medicine training. While comprehensiveness remains a hallmark of family medicine, the current breakdown of training time is not reflective of the practice patterns for the majority of family physicians.<sup>11</sup> A strategic decrease in the time required in experiences such as inpatient pediatrics, and a refocus on high-functioning outpatient clinics would more closely reflect the future needs of graduates. Only 24.1% of respondents to a

recent survey felt that it was still important to teach inpatient pediatrics to family medicine residents.<sup>12</sup> Use of “selective” or “area of concentration” opportunities could provide more cohesive learning experiences in important areas such as health equity and advocacy. This calls for a change in specific rotation requirements, different approaches to teaching and evaluation, and more flexibility in the overall curriculum, but it does not require an increase in length of training. Ultimately, flexibility should remain with the learner. There are ample fellowship and advanced degree opportunities for those who desire additional time for structured learning. The number of family medicine residents who choose to pursue fellowships is relatively small.<sup>13</sup>

Three years of family medicine residency is producing well-trained family physicians. Keeping the needs of patients, communities, and physicians at the forefront, learners should be able to determine for themselves the type and timing of any additional training. Ultimately, flexibility and autonomy will provide a consistent pipeline of well-trained, satisfied, and engaged family physicians to serve their patients and communities for generations to come.

**ACKNOWLEDGEMENTS:** The author acknowledges the assistance of Aaron George, DO, FAAFP, Meritus Health, Hagerstown, Maryland; and Deborah Taylor, PhD, North Ft Myers, Florida.

**CORRESPONDENCE:** Address correspondence to Dr Donald Raj Woolever, MD, Director, Maine-Dartmouth Family Medicine Residency, 15 East Chestnut Street, Augusta, ME 04330. 207-798-9756. raj.woolever@mainegeneral.org.

### References

1. Merritt Hawkins Review of Physician and Advanced Practitioner Recruiting Incentives. Dallas, TX: Merritt Hawkins; 2020.
2. 2020 Physician Compensation Benchmarks. Englewood, CO: Medical Group Management Association; 2020.
3. Accreditation Council for Graduate Medical Education Family Medicine Review Committee, Chicago, IL. Accessed March 2021.
4. The Complexities of Physician Supply and Demand: Projections From 2018 to 2033. Washington, DC: Association of American Medical Colleges; 2020. <https://www.aamc.org/data-reports/workforce/data/complexities-physician-supply-and-demand-projections-2018-2033>. Accessed April 23, 2021.
5. Regenstien M, Nocella K, Jewers MM, Mullan F. The cost of residency training in teaching health centers. *N Engl J Med*. 2016;375(7):612-614. doi:10.1056/NEJMp1607866
6. Douglass AB, Barr WB, Skariah JM, et al. Financing the fourth year: experiences of required 4-year family medicine residency programs. *Fam Med*. 2021;53(3):195-199. doi:10.22454/FamMed.2021.249809



7. Hoekzema G. Trends in Family Medicine Residency Clinical Data from ACGME WebADS. Starfield Summit Position Paper. December 2020.
8. Youngclaus J, Fresne JA. Physician Education Debt and the Cost to Attend Medical School: 2020 Update. Washington, DC: Association of American Medical Colleges, 2020. [https://store.aamc.org/downloadable/download/sample/sample\\_id/368/](https://store.aamc.org/downloadable/download/sample/sample_id/368/). Accessed April 23, 2021.
9. American Board of Family Medicine Survey of Residency Faculty and Diplomates: Preliminary Results, 2020. Lexington, KY: ABFM; 2020.
10. Hopson L, Regan L, Gisondi MA, Cranford JA, Branzetti J. Program director opinion on the ideal length of residency training in emergency medicine. *Acad Emerg Med*. 2016;23(7):823-827. doi:10.1111/acem.12968
11. Coutinho AJ, Phillips RL Jr, Peterson LE, Peterson LE. Intended vs reported scope of practice. *JAMA*. 2016;315(20):2234-2235. doi:10.1001/jama.2016.1727
12. Newton W, Mitchell K. Re-Envisioning Family Medicine Education. Residency Leadership Summit Pisacano Plenary. March 2021.
13. Sairenji T, Dai M, Eden AR, Peterson LE, Mainous AG III. Fellowship or further training for family medicine residents? *Fam Med*. 2017;49(8):618-621.

## What Family Medicine Can Learn From Other Specialties

Warren Newton, MD, MPH; Michael Magill, MD

(Fam Med. 2021;53(7):606-7.)

doi: 10.22454/FamMed.2021.976389

Published Online First May 26, 2021

Family medicine is not the only specialty with passionate commitment to excellence in residency education and the formation of young physicians. The major revision of the program requirements for family medicine and the related American Board of Family Medicine (ABFM) policy on board eligibility can take inspiration from other specialties to individualize resident experience, enhance evaluation, and perhaps offer an innovative fourth-year experience to help residents master the increasingly complex reality of family practice.

A first option would be to adapt residents' experiences to meet individual learning needs and support career development. Pediatrics is leading development of formal individualized learning plans<sup>1</sup> during residencies. These are similar to our "areas of concentration,"<sup>2</sup> but with 6 months and typically more specificity and rigor. Developing such plans inevitably raises the question of the value of some of the rotations in our current requirements.

What we give up when we must change is important evidence of what we value. In the summer of 2020, the ABFM asked program directors what rotations they had eliminated in response to the pandemic. Programs most often cancelled subspecialty surgery, elective, and nursing home experiences. In parallel, and in preparation for the summit the Association of Family Medicine Residency Directors surveyed residency directors and the ABFM surveyed residents and residency faculty to ask what curriculum should be eliminated to make room in the curriculum for new requirements that might come with the new standards.<sup>3,4</sup> There was significant agreement that inpatient surgery, most subspecialty surgical rotations,

and inpatient pediatrics could be considered for removal, seemingly reflecting concern about the passive education in many subsurgical rotations and ineffective use of elective time. The surveys thus suggest that there is potential curricular space to individualize training in support of career development and help residents move beyond proficiency to mastery. We might think of offering "Areas of Concentration on Steroids," with more time, better focus, and accomplishment.

A second option is to conduct an in-person oral examination and assessment of clinical skills at the end of residency. The cultural, logistical, and financial challenges of adding this kind of intense individualized assessment would be daunting in family medicine. But many other specialties do this, including many surgical disciplines, physical medicine and rehabilitation, and emergency medicine. Our colleagues in these fields have learned how to conduct oral exams fairly, and they distinguish between the knowledge typically assessed in an examination with multiple choice questions and judgement and clinical decision-making uniquely assessable in oral examinations by trained examiners. One of the best examples is in the American Board of Urology, which combines an oral examination in combination with a practice log covering the first 16 months in practice, a description of the practice demographics, peer review from community urologists and explicit attention

---

From the American Board of Family Medicine, Lexington, KY (Drs Newton and Magill); Department of Family Medicine, University of North Carolina - Chapel Hill (Dr Newton); and Department of Family and Preventive Medicine, University of Utah, Salt Lake City, UT (Dr Magill).

to professionalism and the ethics of practice,<sup>5</sup> with particular emphasis on performance of unnecessary procedures. Surely judgement, clinical decision-making, and professionalism are critical for family physicians as we manage multimorbid patients with difficult family situations and challenging social contexts across the continuum of care!

Another example is in anesthesiology. To better assess clinical skills, the American Board of Anesthesiology has incorporated objective structured clinical examinations of communication and point-of-care ultrasound into the final component of board certification. For example, they ask candidates to demonstrate ability to deliver bad news.<sup>6</sup> Our anesthesia colleagues report that this kind of assessment has identified residents with excellent test scores but poor communications skills, and that these changes in certification have led to dramatic changes in anesthesia residencies. What about us? Family medicine has substantial experience and expertise with objective structured clinical examinations and in behavioral health and doctor-patient communication; do we think that assessment of communication—or, indeed, point-of-care ultrasound—is important enough to develop a national system to assure competence in all graduating residents?

A third option may be the most challenging: we could add a year of required clinical experience. As argued in this issue by Alan Douglass, MD, our current 3-year curriculum feels like an overstuffed potato to many in our community. Family medicine is complex, and is becoming more complex as family physicians lean into emerging clinical and health care problems such as opiate addiction, exploding multimorbidity, deeply disintegrated care, structural determinants of health and health equity. How might we implement a fourth year of experience in family medicine? We have several options. The Length of Training pilot program<sup>7-9</sup> has shown the potential value of a fourth year of residency and has helped grow support for adding a fourth year, but still only a minority of residency program directors, faculty, and residents support it.<sup>10,11</sup> Traditional Accreditation Council for Graduate Medical Education-accredited fellowships such as sports medicine, hospice and palliative medicine, or geriatrics might also count, as would any of the myriad of informal extra-year fellowships such as faculty development, maternity care, or hospitalist care that exist now or could be developed. Keeping in mind the intense education typical

of the first year out in practice, a final option might be a mentored experience in the first year in practice, such as in a frontier, underserved, or other practice setting, prior to board certification. The rationale would be both practical and developmental. The focus would be on developing new skills and professionalism, and just enough structure to support learning.

**CORRESPONDING AUTHOR:** Address correspondence to Dr Warren Newton, American Board of Family Medicine, 1648 McGrathiana Pkwy, Suite 550, Lexington, KY 40511. 919-604-1241. WNewton@theabfm.org.

## References

1. ACGME Program Requirements for Graduate Medical Education in Pediatrics. Chicago: Accreditation Council for Graduate Medical Education; 2020. [https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/320\\_Pediatrics\\_2020.pdf?ver=2020-06-29-162726-647](https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/320_Pediatrics_2020.pdf?ver=2020-06-29-162726-647). Accessed May 1, 2021.
2. AFMRD Guidelines for Individual Areas of Concentration. Leawood, KS: Association of Family Medicine Residency Directors. [http://glfhc.org/residency/wp-content/assets/sites/7/2017/07/AFMRD-AOC\\_individual\\_guidelines.pdf](http://glfhc.org/residency/wp-content/assets/sites/7/2017/07/AFMRD-AOC_individual_guidelines.pdf). Accessed May 2, 2021.
3. AFMRD Survey on ACGME Program Requirement Revisions. 2020. <https://static1.squarespace.com/static/5ef55bb3b8ab0958a88de0ac/t/5f613e96038ef679ebb3881f/1600208535779/AFMRD+Survey+on+ACGME+Program+Requirement+Revisions.pdf>. Accessed May 1, 2021.
4. Starfield Summit IV: Re-Envisioning Family Medicine Residency Education Community Dialogue Survey Results. <https://residency.starfieldsummit.com/community-dialogue>. Accessed May 1, 2021.
5. Thrasher JB, Hamady CR, Franklin LW. Medical professionalism is like pornography: you know it when you see it. *J Am Board Fam Med.* 2020 Sep-Oct;33(Suppl):S62-S64. doi:10.3122/jabfm.2020.S1.190408.
6. ABA Launches OSCE for Certification [press release]. Raleigh, NC: American Board of Anesthesiology; March 29, 2018. <https://aba-thelatest.org/2018/03/aba-launches-osce-for-certification/>. Accessed May 1, 2021.
7. Eiff MP, Ericson A, Uchison EW, et al. A comparison of residency applications and match performance in 3-year vs 4-year family medicine training programs. *Fam Med.* 2019;51(8):641-648. doi:10.22454/FamMed.2019.558529
8. Carney PA, Ericson A, Conry CM, et al. Financial considerations associated with a fourth year of residency training in family medicine: findings from the Length of Training Pilot Study. *Fam Med.* 2021;53(4):256-266. doi:10.22454/FamMed.2021.406778
9. Tepperberg S, Barnett KG, Fischer J, Johnson M, Coles S, Hines T. Training toward our future: questions about length of training in family medicine programs. *Fam Med.* 2019;51(8):636-637. doi:10.22454/FamMed.2019.711802
10. Re-envisioning Family Medicine Residency Education: Faculty. 2020. [https://static1.squarespace.com/static/5ef55bb3b8ab0958a88de0ac/t/5fdb81a8dc9a6b6cb05a24b0/1608221096476/Faculty\\_All\\_201214\\_.pdf](https://static1.squarespace.com/static/5ef55bb3b8ab0958a88de0ac/t/5fdb81a8dc9a6b6cb05a24b0/1608221096476/Faculty_All_201214_.pdf). Accessed May 3, 2021.
11. Re-Envisioning Family Medicine Residency Education: Q1 Year of Expected Graduation from Residency. 2020. [https://static1.squarespace.com/static/5ef55bb3b8ab0958a88de0ac/t/5fdb81cb1b50515c6a61350f/1608221131118/Resident\\_All\\_201214\\_.pdf](https://static1.squarespace.com/static/5ef55bb3b8ab0958a88de0ac/t/5fdb81cb1b50515c6a61350f/1608221131118/Resident_All_201214_.pdf). Accessed May 3, 2021.

## Promoting Active Learning in Residency Didactic Sessions

Todd Zakrajsek, PhD; Warren Newton, MD, MPH

(Fam Med. 2021;53(7):608-10.)

doi: 10.22454/FamMed.2021.894932

Published Online First May 26, 2021

In the early 1990s, a revolution began in the American higher educational system. The time had come to change the focus of education from teaching to learning.<sup>1</sup> Instead of focusing on what was covered in a didactic session, such as grand rounds, a call emerged to shift the focus instead to the extent that learners actually learned. In theory, this shift would have been readily accepted by educators as a logical direction to pursue. In practice, however, moving educational practices in this direction has been an exceedingly difficult challenge. Changing practice is never easy. To move from teaching to learning, educators must think about teaching in a different way. This shift means moving from traditional lectures of content-laden material to instructional methods designed to draw learners directly into their own learning, and difficulty has been increased by the ubiquity of PowerPoint software. Succinctly stated by King in 1993, it involves moving “from sage on the stage to guide on the side.”<sup>2</sup>

In the early 1990s, this new approach to focus on learner engagement was named “active learning.” The credit for launching the term is most often attributed to Bonwell and Eison.<sup>3</sup> In their groundbreaking book, they defined active learning as “anything that involves the students in doing things and thinking about the things they are doing.” Note the inclusion of two aspects of active learning: students “doing things” (eg, preparing for the learning session, participating in discussion with other learners, taking notes) and “thinking about things they are doing” (eg, reflection, classroom assessments). It is important to note that active

learning pertains to all forms of learning: precepting, small group teaching, and large-group didactics. An educational experience is active based on what happens with the learner, not the number of learners present.

Although the active learning movement began 30 years ago, many family medicine residencies have not fully embraced this instructional approach. One reason may well be that our language runs counter to the concept of active learning. For example, in medical education, the word “didactic” is often synonymous with all formal teaching. The Oxford Advanced Learner’s Dictionary defines “didactic” as “telling people things rather than letting them find out for themselves.” A system of education whereby learners are “told” is efficient when it works. Unfortunately, studies over the past 25 years have consistently shown that extended lectures are not an effective instructional strategy.<sup>4-6</sup> Although efforts to improve education in family medicine have often included statements like “family medicine should devise effective methods to teach community medicine...”<sup>7</sup> there is often a lack of information about the process by which that should happen.

Making a major shift in the way we teach is no small feat. At this time, however, an ever-increasing body of work clearly and consistently documents active learning effectiveness over traditional lecture through the use of an increasing number of supporting teaching

---

From the University of North Carolina – Chapel Hill (Drs Zakrajsek and Newton); and the American Board of Family Medicine, Lexington, KY (Dr Newton).

strategies and educational technology solutions.<sup>8</sup> Within family medicine, recent studies have similarly highlighted the effectiveness and use of active learning in both undergraduate<sup>9,10</sup> and graduate medical education settings.<sup>11</sup>

In preparation for the family medicine residency summit, the American Board of Family Medicine conducted a national survey of both residency faculty and residents about how residency conferences are taught.<sup>12</sup> The results paint a mixed picture. Didactic sessions represent a substantial commitment of time; over 86% of residency faculty and residents report over 4 hours of formal conferences per week, with 72% of residency faculty reporting that, during the pandemic, the didactic curriculum was unchanged and an extra 22% reporting only a slight decrease in time. Attendance is variable, however, with 21% of residents reporting attending less than half of the conferences and only about 50% of residents reporting attending more than 75% of the conferences.

Over 80% of residents report having required prereading or material to review in advance in less than 25% of conferences. Fifty-two percent of residents report that over half of the sessions used interactive techniques such as case discussion, polling, or other techniques. Faculty and resident estimates of the need for preparation and the use of interactive learning was similar: there is clearly substantial room for improvement in making learning more likely to be effective. Residents also report significant amounts of personal teaching, with 63% of the national sample having taught at least one session in the 3 months prior to the survey, but only 29% report formal training in teaching. The culture of “see one, do one, teach one” is alive and well: without being taught evidence-based strategies for effective teaching, many residents will likely anchor their teaching strategies in how they were taught, which often does not include active learning strategies. These results need to be considered in the context of the methodology that is described on the website. Of faculty interested in contributing to the project of reenvisioning the future of residency education, 543 faculty (65.1% response rate), and 301 residents (50.4% response rate) responded. In addition, the survey took place in the fall of 2020, when there was ongoing impact of the COVID-19 pandemic on resident clinical care and schedules.

## A Way Forward

Whither active learning in residency didactic sessions? Of course, residencies are on-the-job training, in which the majority of learning is by doing, using an apprenticeship and small-team teaching model. This emphasis is as it should be, and is codified by residency standards that acknowledge that clinical emergencies take precedence over formal didactics. Educationally, however, we believe that didactic sessions are an important part of the residency curriculum. They represent a substantial commitment of time for both faculty and residents. They support key components of education (knowledge retrieval, interleaving, and spaced repetition<sup>13-15</sup>), which modern educational research underscores are critical in learning. How we teach them is thus a key component of the strategy for renewing family medicine residency education.

We look forward to more research on how best to support learning in residency didactic sessions. In the meantime, however, a primary question is how much? Four to 6 hours per week is current typical practice, amounting to a half day per week or a little more. Is this the right amount? Is attendance required? How often should clinical emergencies get in the way, and is charting an emergency? A parallel question is whether to organize conferences in focused academic half days or distributed across the week. Both have a good rationale, depending on local geography and culture. Finally, in an age of hard limits to duty hours, are didactic sessions important enough to put in the morning, when almost all residents can attend, but when faculty need to cover clinical demands in the office and hospital?

As for pedagogy, we propose that all residency didactic sessions, both large and small sessions, on site or online, include active learning strategies, with assignment of carefully selected prework. These strategies must clearly include learners in “doing things and thinking about the things they are doing.” This does not necessarily imply that lectures cease, but that active learning strategies be used to augment lectures. In addition, all didactic sessions should include strategies for assessing learning either during or at the end of the session. Assessments should be more than resident satisfaction; evaluations should attempt to capture gaps in knowledge and practice and specific intended clinical practice changes. Active learning strategies may result in less content being covered by the teacher in a lecture format, but

should not result in less learning. The principle is that assessment drives learning.

Active learning strategies should always include research-based aspects of how humans learn, be it problem-based learning, small-group discussion, simulations, or lectures. The field of human learning and memory is a complex area of specialization, and research continues to reveal important factors associated with areas such as brain-based learning, the impact of individual life experiences and culture on learning, and educational technologies.<sup>16</sup> Additionally, there are universally accepted aspects of learning described by educational psychologists and others that have promise to improve family medicine residency teaching immediately. A few examples of learning components that have received extensive research include encoding specificity, targeted feedback, activation of prior knowledge, reducing cognitive load, practice at recall, and developing metacognitive skills.<sup>16-17</sup> Most importantly, these factors are typically independent of the type of learning, learner preferences, whether the learning is skills-based or factual, and whether the learner is in a classroom or walking down the street.

We also recommend that all residents get training in teaching. As all of us appreciate, the etymology of “doctor” is “teacher,” and teaching, whether of patients, peers, other professionals or community members, is a key aspect of our traditional role. When and how best to train teaching is ripe for innovation and dialogue in the specialty, but it seems clear that it will be helpful for faculty development to develop evidence-based curricula in teaching for residents. The specialty has a significant opportunity to improve the teaching that young physicians give both formally and informally throughout their careers.

In conclusion, it seems clear that the revision of family medicine residencies will incorporate a major emphasis on competency-based education. We endorse the emphasis on competencies and outcomes with enthusiasm. But we also believe that how we teach is important, and that formal didactic conferences can play a critical role in residency education. Rethinking how we teach, drawing on the extensive research related to human learning, is critical to reenvisioning family medicine residency education.

**CORRESPONDING AUTHOR:** Address correspondence to Dr Warren Newton, American Board of Family Medicine, 1648 McGrathiana Parkway, Lexington, KY 40511. 919-604-2041. wnewton@theabfm.org.

## References

1. Barr RB, Tagg J. From teaching to learning — a new paradigm for undergraduate education. *Change*. 1995;27(6):12-26. doi:10.1080/00091383.1995.10544672
2. King A. From sage on the stage to guide on the side. *Coll Teach*. 1993;41(1):30-35. doi:10.1080/87567555.1993.9926781
3. Bonwell C, Eison J. *Active Learning: creating excitement in the classroom*. Information Analysis-ERIC Clearinghouse Products; 1991. <http://files.eric.ed.gov/fulltext/ED336049.pdf>. Accessed July 14, 2018.
4. Freeman S, Eddy SL, McDonough M, et al. Active learning boosts performance in STEM courses. *Proc Natl Acad Sci USA*. 2014;111:8410-8415. doi:10.1073/pnas.1319030111
5. Hake R. Interactive-engagement vs. traditional methods: a six-thousand-student survey of mechanics test data for introductory physics courses. *Am J Phys*. 1998;66(1):64-74. doi:10.1119/1.18809
6. Deslauriers L, Schelew E, Wieman C. Improved learning in a large-enrollment physics class. *Science*. 2011;332(6031):862-864. doi:10.1126/science.1201783
7. Martin JC, Avant RF, Bowman MA, et al; Future of Family Medicine Project Leadership Committee. The Future of Family Medicine: a collaborative project of the family medicine community. *Ann Fam Med*. 2004;2(suppl 1):S3-S32. doi:10.1370/afm.130
8. Major CH, Harris M, Zakrajsek T. *Teaching for Learning: 101 Intentionally Designed Educational Activities to Put Your Students on the Path to Success*. New York, NY: Routledge; 2016.
9. Roshni M, Rahim A. Small group discussions as an effective teaching-learning methodology for learning the principles of family medicine among 2nd-year MBBS students. *J Family Med Prim Care*. 2020;9(5):2248-2252. doi:10.4103/jfmpc.jfmpc\_1228\_19
10. Everard KM, Schiel KZ. Learning outcomes from lecture and an online module in the family medicine clerkship. *Fam Med*. 2020;52(2):124-126. doi:10.22454/FamMed.2020.211690
11. Armson H, Wycliffe-Jones K, Mackay MP, Roder S. Academic half-days: facilitated small groups to promote interactive learning. *Fam Med*. 2020;52(1):53-64. doi:10.22454/FamMed.2020.947981
12. Starfield Summit V: Re-Envisioning Family Medicine Education. <https://residency.starfieldsummit.com/community-dialogue>. Accessed March 10, 2021.
13. Raget D. Introduction to Chunks and Rules. <https://www.w3.org/Data/demos/chunks/chunks.html>. Accessed May 1, 2021.
14. Rohrer D. Interleaving helps students distinguish among similar concepts. *Educ Psychol Rev*. 2012;24(3):35-367. doi:10.1007/s10648-012-9201-3
15. Glen D. Close the book, recall, write it down. *Chron High Educ*. 2009;55(34):A1.
16. National Academies of Sciences, Engineering, and Medicine. *How people learn II: learners, contexts, and cultures*. Washington, DC: The National Academies Press; 2018.
17. Gluck MA, Mercado E, Myers C. *Learning and memory: from brain to behavior*. 4th ed. New York, NY: Worth Publishers; 2020.