

Teaching the Teachers With Milestones: Using the ACGME Milestones Model for Professional Development

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Physicians-in-training are educated through the paradigm of competency-based medical education (CBME), which promotes progressive development of expertise. To better support CBME, the Accreditation Council for Graduate Medical Education (ACGME) introduced the Milestones assessment framework across all ACGME-accredited graduate medical education (GME) training programs.^{1,2} Milestones are behavioral descriptions of the developmental trajectory of trainees in the GME environment, which provide longitudinal and trajectory-based metrics along domains of physician competency. These metrics aim to promote lifelong learning and ensure residents and fellows are “ready for autonomous practice” at graduation. Yet, such “readiness for autonomous practice” at the completion of training does not equate with the completion of professional learning, nor does it preclude the development of further levels of expertise.

To ensure ongoing professional development following training, continuing medical education (CME) and continuing certification initiatives have aimed to maintain and expand competence via meaningful feedback in an iterative, safe, and interactive process for practicing clinicians.^{3–5} However, as currently implemented, CME has been criticized with cost concerns, burden, complexity, lack of authenticity to practice, and insufficient linkage to GME. In this context, novel ideas to promote professional development are needed for practicing physicians. For certain skills, a trajectory-based framework (akin to the concept of the Milestones) in CME could more closely align expectations of new graduates within the context of realistic practice settings, providing a framework for further ongoing professional development.

Extending the Milestones framework to faculty development may promote structured professional development as a core of advancement and provide a

unified approach to faculty development. However, there are multiple barriers to the incorporation of this framework across all CME initiatives, including the risk of added administrative burdens, identification of experts to create such Milestones, and logistical challenges of ensuring validity of assessment strategies. We therefore propose using this framework for discrete skills and focused career paths, such as for practicing clinician-educators, which may be the ideal setting for this approach. By using a Milestones system in clinician-educator faculty, longitudinal and trajectory-based metrics along specific educator domains could be delineated for self-improvement and individual skill development, with clear metrics for advancement and promotion for institutions.

A Milestones framework for the professional development of clinician-educators could be advantageous for many reasons. First, the universality of educator skills (even across myriad domains) are prime for ubiquitous trajectory-based faculty development. As educators in the era of CBME, we are familiar with using Milestones for GME learner assessment. Using existing medical education frameworks, such as the Dreyfus model, faculty Milestones could focus on the fundamental skills necessary to excel as a clinician-educator. These could also provide unique opportunities for self-assessment and self-directed learning across discrete areas, such as in administration, research, and curricular development, beyond what is currently available through traditional CME programs. Operationalizing the Milestones in the ongoing development of clinician-educators could be the next big step forward in professional development for physicians, highlighting a novel pathway for CME.

While novel in the CME sphere, this paradigm of progressive attainment of expertise has already been successfully implemented in other education settings. In K–12 settings, educators may engage in a robust series of assessments to seek certification as National Board-Certified Teachers (NBCTs). Requirements

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TABLE

Example of Longitudinal Framework for National Board Certification for Teachers

Component	Mechanism of Assessment
Content knowledge	Structured examinations via computerized assessment program
Differentiation in instruction	E-portfolio (prompts teachers to review students' growth as demonstrated through their individual work; teachers demonstrate their analysis of student strengths and needs and how they use this analysis to intentionally design instruction enabling all students to learn)
Teaching, practice, and learning environment	Video-based portfolio entries (highlighting observable teaching practices in different contexts, with teacher reflections on the impact of their chosen instructional methods)
Effective and reflective practitioner	Evidence of the use of assessment data for student and teacher growth (reflecting current educational research and consistent with the instructional and assessment practices of the National Board Standards)

Note: Adapted from the National Board for Professional Teaching Standards. Redesigning National Board Certification: The Advancement of Accomplished Teaching. https://www.nbpts.org/wp-content/uploads/Redesigning_National_Board_Certification.pdf. Accessed March 8, 2021.

include completion of a “rigorous, content-specific, performance-based, and reflective portfolio...well beyond requirements for initial teacher licensure” in multiple content areas (TABLE).⁶ Achievement of NBCT status in K–12 educators has been associated with improved student performance⁷ and diminished teacher attrition. The medical education community could create similar standards and enhance the interoperability of instructional design, assessment, and the clinical learning environment for clinician-educators, although it is important to note that this program is voluntary for educators (with likely significant intrinsic motivation). However, this could make our learners' experiences more consistent nationwide and across the medical education continuum. It could inform a research agenda to identify better practices, reduce inefficiencies and redundancies, and add value to medical education.⁸

Beyond providing discrete areas of self-improvement, the Milestones system could additionally serve as an important component of promotional criteria for clinician-educators, by offering clear signposts and future areas of growth. Although domains of educational excellence and promotional metrics have been proposed for clinician-educators,^{9–12} there remains significant discordance between the perspectives of clinician-educators versus promotion and tenure committees on this topic.¹⁰ Use of a structured Milestones system could better align these groups. In the business world, offering clear criteria for promotion and/or growth (as would be present in faculty Milestones) has actually been associated with increased employee engagement, performance, productivity, and motivation,^{13–15} so similar benefits in medical faculty development may be observed.

Importantly, prior to widespread adoption of this approach, several potential issues must be acknowledged. First, the development of Milestones specific to the diverse skillset of a clinician-educator would require the creation of unique Milestones, outlining

the expected trajectory of faculty from novice clinician-educator to the highest level of expertise in each domain. Inclusion of relevant stakeholders to ensure applicability, content validity, and relevance would be critical. Such a process would require significant time investment for creation and development of acceptable Milestones, faculty training for optimal use, and development of novel assessment tools. Given the diversity of career goals and pathways for clinician-educators,¹⁶ expertise would have to be defined individually using this framework. Overall, success of such a framework would require acceptability by faculty (as it has been shown that passive participation is a major detriment to current CME programs¹⁷), but the potential for improved orientation with professional goals may overcome this issue.

Beyond these issues, there are potential downstream ramifications of using Milestones for professional development of clinician-educators. Creation of this framework may be incorporated into certification processes, credentialing, and licensing requirements, despite being proposed predominantly as a mechanism for ongoing self-directed learning and improvement. This framework may also lead to increased assessments of clinician-educators. While this is critical to progressive skill attainment, ensuring validity evidence of assessments without adding significant administrative time for faculty would be critical.

Notably, while we propose use of this framework in a relatively narrow focus of clinician-educators, there are several additional areas where the Milestones framework could be potentially implemented for professional development purposes. For example, we can envision an opportunity to align this framework within other aspects of CME, such as Maintenance of Certification and self-assessment processes. Such alignment could counter some of the arguments against current CME, by providing a framework that

can be personalized toward specific areas of growth in various domains and assessed by a variety of methods.

Overall, ongoing physician growth requires a structured approach that aligns with known models of progressive expertise, which has been developed through the Milestones system, with the ultimate goal to ensure optimal patient care and to produce better physicians. Future work is needed to further develop such Milestones, followed by work analyzing the acceptability, feasibility, and implementation of such a framework in professional development. The familiarity of current educators with this assessment framework and the alignment with CBME makes it a novel and unique approach to faculty professional development, particularly for clinician-educators.

References

1. Carraccio C, Iobst WF, Philibert I. Milestones: not millstones but stepping stones. *J Grad Med Educ*. 2014;6(3):589–590. doi:10.4300/JGME-D-14-00343.1.
2. Carraccio C, Englander R, Gilhooly J, et al. Building a framework of entrustable professional activities, supported by competencies and milestones, to bridge the educational continuum. *Acad Med*. 2017;92(3):324–330. doi:10.1097/ACM.0000000000001141.
3. Davis DA, Mazmanian PE, Fordis M, Van Harrison R, Thorpe KE, Perrier L. Accuracy of physician self-assessment compared with observed measures of competence: a systematic review. *JAMA*. 2006;296(9):1094–1102. doi:10.1001/jama.296.9.1094.
4. Eva KW, Regehr G. Effective feedback for maintenance of competence: from data delivery to trusting dialogues. *CMAJ*. 2013;185(6):463–464. doi:10.1503/cmaj.121772.
5. Gordon MJ. Self-assessment programs and their implications for health professions training. *Acad Med*. 1992;67(10):672–679. doi:10.1097/00001888-199210000-00012.
6. Petty TM, Good AJ, Heafner TL. A retrospective view of the National Board Certification process. *Educ Forum*. 2019;83(2):215–230. doi:10.1080/00131725.2019.1576245.
7. Cowan J, Goldhaber D. National Board Certification and teacher effectiveness: evidence from Washington state. *J Res Educ Eff*. 2016;9(3):233–258. doi:10.1080/19345747.2015.1099768.
8. Asch DA, Grischkan J, Nicholson S. The cost, price, and debt of medical education. *N Engl J Med*. 2020;383(1):6–9. doi:10.1056/NEJMp1916528.
9. Roberts DH, Schwartzstein RM, Weinberger SE. Career development for the clinician-educator. Optimizing impact and maximizing success. *Ann Am Thorac Soc*. 2014;11(2):254–259. doi:10.1513/AnnalsATS.201309-322OT.
10. Ryan MS, Tucker C, DiazGranados D, Chandran L. How are clinician-educators evaluated for educational excellence? A survey of promotion and tenure committee members in the United States. *Med Teach*. 2019;41(8):927–933. doi:10.1080/0142159X.2019.1596237.
11. Simpson D, Marcdante K, Morzinski J, et al. Fifteen years of aligning faculty development with primary care clinician-educator roles and academic advancement at the Medical College of Wisconsin. *Acad Med*. 2006;81(11):945–953. doi:10.1097/01.ACM.0000242585.59705.da.
12. Simpson D, Marcdante K, Souza KH, Anderson A, Holmboe E. Job roles of the 2025 medical educator. *J Grad Med Educ*. 2018;10(3):243–246. doi:10.4300/JGME-D-18-00253.1.
13. Gallup. Re-Engineering Performance Management. <https://www.gallup.com/workplace/238064/re-engineering-performance-management.aspx>. Accessed March 2, 2021.
14. Gallup. 2018 CliftonStrengths Meta-Analysis Report. <https://www.gallup.com/cliftonstrengths/en/270350/2018-cliftonstrengths-meta-analysis-report.aspx>. Accessed March 2, 2021.
15. Goler L, Gale J, Grant A. Let's not kill performance evaluations yet. *Harvard Business Review*. November 2016. <https://hbr.org/2016/11/lets-not-kill-performance-evaluations-yet>. Accessed March 2, 2021.
16. Srinivasan M, Li S-TT, Meyers FJ, et al. “Teaching as a competency”: competencies for medical educators. *Acad Med*. 2011;86(10):1211–1220. doi:10.1097/ACM.0b013e31822c5b9a.
17. Holmboe ES, Cassel C. Continuing medical education and maintenance of certification: essential links. *Perm J*. 2007;11(4):71–75.



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