

Introduction

The value of Milestones in the assessment and development of residents and fellows has been demonstrated across medical specialties and are integral to competency-based medical education (CBME).^{1,2} The importance of the Clinician Educator role in delivery of CBME is well-recognized.³ The Accreditation Council for Graduate Medical Education (ACGME), Accreditation Council for Continuing Education, the Association of American Medical Colleges, (AAMC) the American Association of Colleges of Osteopathic Medicine (AACOM) and specialty educational societies have thus committed to generation of Clinician Educator Milestones to aid in assessment of teaching effectiveness and ongoing professional development of medical educators. (Table 1)

Table 1. Clinician Educator Milestones Project Domains and Competencies

Domains of Competence	Competencies	Subcompetencies
Administration	Demonstrate administrative skills relevant to their professional role, program management, and the learning environment that leads to best health outcomes for the society	<ul style="list-style-type: none">• <i>Administration Skills</i>• <i>Leadership Skills</i>• <i>Learning Environment</i>• <i>Change Management</i>
Educational Theory and Practice	Ensure the optimal development of competent learners through the application of the science of teaching and learning to practice.	<ul style="list-style-type: none">• <i>Feedback</i>• <i>Scholarship</i>• <i>Professionalism</i>• <i>Learner Assessment</i>• <i>Program Evaluation</i>• <i>Remediation</i>• <i>Teaching</i>• <i>Science of Learning</i>• <i>Learner Professional Development</i>
Well Being	Apply principles of wellbeing to develop and model a learning environment that supports behaviors which promote personal and learner psychological, emotional, and physical health	<ul style="list-style-type: none">• Well-Being of Self, Learner, and Colleagues
Diversity Equity and Inclusion	Acknowledge and address the complex intrapersonal, interpersonal, and systemic influences of diversity, power, and inequity (power, privilege) to promote equity and inclusion in all settings to optimize patient outcomes and so that all educators and learners can thrive and be successful.	<ul style="list-style-type: none">• Diversity, Equity, and Inclusion

Background

Milestones History

In prior models of medical education, knowledge and skills were transferred directly from the educator to the learner. Summative assessments were used to determine the learner's capacity to reiterate key material.

By the early 1990s, the value of outcomes-based or CBME was recognized as an effective method to frame education and assessment around acquisition of knowledge and skills essential to the practice for health care professionals.⁴ At the end of the 20th century, health care professions embraced CBME as a promising way to educate and assess development of clinicians based on acquisition of skills deemed essential for effective patient care.^{5,6} In 1999, the ACGME and American Board of Medical Specialties (ABMS) published the six core competencies as a framework for medical practice:⁷

- Patient Care and Technical Skills
- Medical Knowledge
- Interpersonal Communication Skills
- Professionalism
- Practice-based Learning and Improvement
- Systems-based Improvement

In the last two decades medical education reform has focused on methods to determine the ability of trainees to deliver high-quality patient care and improve patient outcomes. In the US, the ACGME Outcomes Project was implemented to support these efforts.⁶ CBME is now considered the gold standard for developing physicians, although design and implementation of competency-based curricula and assessment methods continue to be a challenge.^{8,9}

In 2013, specialty-specific Milestones were introduced as a part of the ACGME's accreditation system to facilitate progressive evaluation of trainees. These Milestones define professional competencies and subcompetencies as behaviors exhibited by competent physicians in each specific discipline.^{10,11} In a similar manner, competencies and Milestones for Clinician Educators, based on their core activities and behaviors, should be useful to facilitate understanding and developing the abilities of teachers in medical education.^{12,13}

Clinical Educator Role in Medical Education

Beyond teaching abilities, an abiding characteristic of successful educators is the commitment to reflection, self-improvement, and lifelong learning.^{14,15} Institutions can support the efforts of educators to develop their skills by fostering an environment of inquiry and rewarding increasing expertise, such as through promotion and other forms of recognition. Annual faculty development is now an ACGME common program requirement.¹⁶ Effective clinician educators are critical to successful learning environments.¹⁷ Highly skilled and competent clinician educators serve key roles in teaching, curriculum development, assessment, mentoring, coaching, advising, individualized learning, and remediation.

Three major forces have stimulated the progress of clinician educators over the last few decades: faculty development, educational scholarship, and the advent of communities of learners.¹⁸ The 21st century clinician educator goes beyond expertise in teaching and facilitating learning, but also applies theory to education practice, engages in education scholarship, and serves as a consultant to other health professionals on education issues.³

Value of developmental model in assessing skills formation

Educators in undergraduate, graduate or continuing medical education are evaluated infrequently. Even when assessed, appraisals of educator performance are often perfunctory, not standardized, and rarely based on learner outcomes. The ACGME, ACCME, AAMC, and AACOM committed to develop Clinician Educator Milestones (CEM) to provide a framework for assessing clinical teaching faculty in a developmental fashion.

CEM will serve as the roadmap for progression in the role of a clinical educator from novice to mastery. Three distinct uses for Clinician Educator Milestones have been identified: 1) To define a developmental plan for clinician educators invested in self-directed life-long learning development of education skills. 2) To assess clinician educator teaching behaviors and performance; and 3) To assess clinician educator skills and performance in a variety of educational leadership activities.

Specific aims of CEM project

The specific aims of the CEM project are to:

1. Develop relevant CEMs that track key teaching and educational leadership activities and provide a graded sequence of behaviors (performance descriptors) for each competency that also can serve as a developmental scaffold for improvement for faculty and those responsible for faculty development efforts at institutions.
2. Provide a manual that explores each competency in more detail and summarizes additional resources and references for each competency.
3. Provide a framework for CEM use and studies to explore and establish their use and value in promoting high quality medical education.

Literature and Conceptual Frameworks

Sir William Osler established the tradition of clinician educators in North America at Johns Hopkins University in the 19th century. Yet in 1997, when definitions of a clinician educator were solicited, there was limited consensus beyond being a superior clinician and a dedicated teacher.¹⁹ Clinician educators are faculty whose major responsibilities as part of the academic mission are patient care and education. They apply empirical evidence and theoretical constructs to education practice that results in effective learning and create and inform educational scholarship.¹⁸ They serve as a consultant to other health professionals on education issues and possess a unique set of knowledge, skills, and attributes.^{3,20}

Methods

The ACGME and ACCME convened a work group in 2020 to create Milestones for clinician educators across the continuum of medical education (undergraduate, graduate and continuing professional development). The ACGME Vice President for Milestone Development solicited the ACGME, ACCME, AAMC, and AACOM for potential workgroup members. Sixteen individuals representing multiple medical specialties in the US, including non-clinical educators, with

varying lengths of experience in medical education, and from both allopathic and osteopathic medicine were chosen to serve on the workgroup. At the first meeting, the workgroup identified two missing stakeholders, a medical student, and a resident; and both were added. (Table 2)

Table 2: Work Group Members

Workgroup Members
Thomas Boyle, DO, MBA
Calvin Chou, MD, PhD
Nicole Croom, MD, MPH (resident)
Tyler Cymet, DO
Rebecca Daniel, MD
Nancy Davis, PhD
Daniel Dent, MD
Laura Edgar, EdD
Janae Heath, MD
Lisa Howley, PhD
Joseph Kaczmarczyk, DO, MPH, MBA
John D. Mahan, MD
Katie Marney (osteopathic medical student)
Amy Miller Juve, EdD, MEd
Brijen Shah, MD
Janine Shapiro, MD
Christine Stabler, MD, MBA

Work to create the Milestones was performed synchronously over a virtual platform and asynchronously utilizing Google Drive.²¹ The workgroup met nine times and performed asynchronous work between each meeting. The process was facilitated by the Vice President of Milestone Development (VPMD) and an ACGME Milestone Project Manager using a modified Delphi approach. The workgroup identified potential stakeholders for their work and potential pitfalls of releasing clinician educator Milestones. Through brainstorming, the workgroup identified 141 potential education related tasks of a clinician educator. The VPMD reviewed definitions of Milestone terminology with the workgroup and then facilitated a discussion to help them identify each task as a competency, subcompetency, Milestone or as needing further consideration.

Tasks marked as competencies were discussed by the group and combined and reduced as appropriate. Each identified subcompetency was independently organized under a corresponding competency by the VPMD. Asynchronously via GoogleForms, the workgroup reviewed the subcompetencies under each competency to determine if subcompetency placements were correct and re-assigned if necessary. For each subcompetency, relevance in the continuum of education (UME, GME, CPD) was defined. The decisions were reviewed synchronously for further refinement, and organization.

The workgroup was divided into small groups to create short descriptive statements for each competency. The descriptive statements were reviewed and edited by the entire workgroup asynchronously and then synchronously by consensus. Subcompetencies also were confirmed by consensus. The workgroup formed smaller groups and were given subcompetencies for

which to create developmental trajectories. These drafts were reviewed and edited by the workgroup. Again, the workgroup was divided into smaller groups to complete the supplemental guide, which contains examples of behaviors that demonstrate each competency, assessment tools, and additional resources. The workgroup then reviewed the supplemental guide and achieved consensus on the contents.

Planned Results and Competencies to be Addressed the Clinician Educator Milestones

The focus of medical school and graduate medical education is to develop competent practitioners for clinical care.^{22,23} The skills needed to teach medicine are different from the skills needed to practice medicine and identification of specific activities and competencies can provide a framework to prepare clinician educators to be effective in medical education. Defining the key skills of a Clinician Educator also may assist in ongoing assessment and promotion of educators.³

The CEM Project identified the key skills of the clinical educator and the developmental steps that define competence and expertise in medical education.

The CEM Project workgroup ultimately identified four domains of competence for the clinician educator: 1) Administration, 2) Educational theory and practice, 3) Well Being, and 4) Diversity, Equity, and Inclusion. Table 1 includes the Competency definitions and the subcompetencies created within each.

Discussion

Based on the defined value of Milestones in assessment and development of learners in medical education, Milestones that focus on skills and behaviors of clinical teaching faculty should have multiple uses for faculty in academic medical centers and other institutions.¹¹ These Milestones can provide a framework for assessment of educational skills of faculty.² Milestones have been useful as self-assessment tools and as narrative-based evaluation for learners from faculty and colleagues.^{24,25} The use of CEM for faculty has not been described but a recent report on Milestones for residents as teachers²⁸ outlined teaching milestones which lacked the rigorous developmental progression that is characteristic in design of these CEM.

Beyond measures of teaching ability and competency, an additional value of CEM will be in facilitation of deliberate practice and self-directed learning.^{25,26} Practical experience with these CEM Milestones will be required to see if they can accurately track evolution of teaching skills in faculty and detect meaningful differences in teaching and educational leadership activities of educators.²⁷

This concept of using Milestones, competencies, and subcompetencies to provide areas for focus on feedback and improvement in performance has been a powerful outcome of Milestones in GME.^{28,29} Another value of CEM can be in systematic evaluation of faculty in programs, departments, institutions, and disciplines. These assessments can detect gaps in performance as indicators for focused faculty development and serve to identify faculty at risk for poor teaching scores for focused coaching.²⁶

Regular collection of CEM can help organizations focus on competency as a means of organizational improvement.³⁰ Thoma and colleagues present a useful construct for how competency assessments of staff and faculty can help health care and educational organizations assess performance at an individual level and use those data to generate program and institutional decisions on investment in faculty development, coaching and leadership in educational programs. The Deliberately Developmental Organization (DDO) framework, as proposed by Robert Kegan and Lisa Lahey, highlights how this data can be used by organizations to best develop their people and programs over time.³¹

The CEM will require detailed assessment of their use in clinical education spaces. Projects to evaluate validity of these Milestones must go beyond content validity to evaluate relationships of these assessments to educational outcomes in learners; response process characteristics (how raters use the Milestones) and the internal structure of this tool (reliability and differences of scores based on characteristics of the Clinician Educator).³²

Summary

The CEM constructed through the process defined in this report should be useful as tools in assessment and development of the critical tasks (competencies) of clinician educators as teachers and educational leaders. Milestone levels for individual educators can be important measures of teaching performance and competency and should align with outcomes in medical education. As the Clinician Educator role has come into increasing focus over the last few decades, this effort by the ACGME, ACCME, AAMC, and AACOM should aid in continued investment in teaching effectiveness and development of valuable medical educators.

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