



Urology Milestones 2.0: The Future Looks Bright

Karim J. Hamawy¹ · Laura Edgar²

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Abstract

Purpose of Review One of the major functions of the Accreditation Council for Graduate Medical Education (ACGME) is to accredit all approved residency programs. This accreditation system is based on both common and program-specific requirements that form the foundation of all ACGME-accredited training programs. Embedded within the program requirements are the essential elements of the Competencies and Milestones. In this review article, we hope to provide the reader with an overview of the current Milestones and a preview of what lies ahead.

Recent Findings Milestones for resident education were implemented approximately 7 years ago. The milestones were intended to create a logical trajectory of professional growth which could be measured and tracked for each sub-specialty. However, substantial variability in both content and developmental progression was seen in many specialties. The ACGME has been actively reviewing the Milestones to insure that there exists harmony across all specialties.

Summary Much has been learned about the milestones since their implementation. As educators, we need to provide a robust and reproducible system for all to use. The future of resident education, Milestones 2.0, will provide the necessary groundwork for a more user friendly system that will allow adequate evaluation of our trainees.

Keywords Milestones 2.0 · Urology · ACGME · Resident education · Competencies

Introduction

The Competencies were first introduced to graduate medical education by the ACGME and American Board of Medical Specialties in 1999. The rationale was to begin to move to an outcomes-based framework incorporating the competencies. As part of the Outcomes Project, the aim was to ensure and improve the quality of graduate medical education (GME). This was in response to public sentiment and policy makers' concerns regarding the need to elevate GME [1]. The Competencies include patient care and procedural skills (PC), medical knowledge (MK), professionalism (PROF),

systems-based practice (SBP), interpersonal and communication skills (ICS), and practice-based learning and improvement (PBLI) [2]. When the Competencies were first introduced, many programs and specialties struggled with implementation into their programs as there was no common understanding of how the Competencies should be woven throughout graduate medical education [3]. Multiple studies from both medical and surgical specialties provided little in the way of shared understanding of the Competencies. Without clear and shared mental models, the specialties as a whole were unable to develop better assessment methods.

In 2009, the ACGME introduced the Milestones as part of the Next Accreditation System [1]. The Milestones are organized by subcompetencies under each of the six Competencies. Each subcompetency includes developmental trajectories that represent essential elements of a Competency [4]. The Milestones provide narrative descriptors of the Competencies and subcompetencies along a continuum. They provide a guide for all GME programs allowing some assurance that graduating residents and fellows have achieved a high level of competency during their training.

It is also important to understand what the Milestones are not. They represent the important essence of a discipline but it

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✉ Karim J. Hamawy
karim.j.hamawy@lahey.org

Laura Edgar
ledgar@acgme.org

¹ Lahey Hospital and Medical Center, 41 Mall Rd., Burlington, MA 01805, USA

² ACGME, 401 North Michigan Avenue, Suite 2000, Chicago, IL 60611, USA

is the programs themselves that need to fill in curriculum and assessment. Milestones do not cover the spectrum of the clinical disciplines nor are they tools to negatively affect program accreditation. The Milestones reported to the ACGME were not designed to be used as evaluation forms. This is why assessment of the Milestones occurs two times per year for each resident. Milestones can be used to determine the educational rationale for a particular rotation or year. Secondly, they can be used for self-assessment of the trainees, allowing them to become stakeholders in the system. Lastly, the Milestones can educate the faculty about their own educational development.

Urology residency programs began to use the Milestones in the 2013–2014 academic year. During implementation of the original Milestones, the ACGME committed to a review and revision process in three to five years for all specialties. This work began in 2016 for urology. The first change was to the PC and MK Milestones, based on reporting data and feedback from program directors.

Essentially, there was little need to change the PC and MK content. Earlier that year, an interdisciplinary, interprofessional review of the PROF, SBP, ICS, and PBLI subcompetencies was initiated and the process of revising these Milestones for urology began.

The Development of Milestones

The bedrock of the milestones is the Dreyfus model of skill acquisition [4]. The model includes five levels and is easily translated for milestones. The original milestones used this model; however, there was much confusion between specialties about the definition of each level. Instead of relying on the original idea of level 1 being “expected of an incoming resident” through level 5 as being “someone who has been in practice for several years,” level 1 for most programs is now a “novice resident” in the “specialty of urology” and level 5 is an “expert resident.” Table 1 demonstrates the meaning of each level.

The revision to the milestones was based on multiple criteria. Research, focus groups, and feedback sent directly to the ACGME guided the revision as to the structure and format [5–8]. Assessment data reported for residents and a 2018 survey of program directors regarding the current PC and MK milestones led to the content revisions [1]. The group responsible for creating the revisions included representatives from the ACGME Urology Review Committee, American Board of Urology, Society of Academic Urologists, volunteers from the urology community, a current resident, and a public member. Together, this group committed to creating a shared mental model of the essential elements for the assessment of urology residents throughout their time in residency. Besides reviewing data, program

requirements, and certification blueprints, the group also reviewed and considered the various frameworks of educational development and assessment. Similar constructs were compared. These included learner behavior, levels of supervision, and transition to practitioner. Each of these constructs aligns with the model and serve as a means of describing the milestones.

The next undertaking was to consider the graduate of 2025. The year 2025 allowed the group to think outside of what is happening to the program and specialty today and consider what changes potentially lie ahead. This brainstorming activity helped the group to determine its final set of subcompetencies and includes tasks performed now that will still be performed, new technologies that are ramping up, and tasks the public will expect of every physician.

The focus on public (patient) expectations is also vital. As program directors and faculty, the majority of our time is concentrated on patient care and medical knowledge acquisition. Today the public expects much more from their physician than in the past. Beyond disease management, the public expects patient safety and shared decision-making as priorities. To do these well, we must make sure that milestone assessment includes quality improvement, diagnostic notes that lead to correct billing and coding, accountability, and much more. As faculty, we must develop the knowledge and skills to ensure our graduates are ready for independent practice.

Once the group develops a draft version of the milestones, it will be available for public comment. Information for the comment period will be sent by ACGME to program directors, program coordinators, and designated institutional officials for each program. ACGME will also include notices in their weekly communications. The Society for Academic Urologists will also notify its members via email. It is anticipated that the new milestones will be ready for review no later than spring 2020.

Subcompetencies and How They Impact Education in Urology Training

As was previously mentioned, the implementation of the competencies faced several challenges. In response, content experts from each specialty created subcompetencies, using narrative milestones to provide specific and developmental descriptions of the general competencies. When the milestones were first developed, each specialty had the flexibility to identify individual subcompetencies and write associated developmental milestones.

However, the resulting specialty-specific milestones demonstrated substantial variability both with respect to content and how the developmental progression is operationalized across milestone levels [5, 6]. The 2nd ACGME Milestones Summit in December 2016 brought together representatives

Table 1 Dreyfus model of skill acquisition

Stage	Description
Novice	<ul style="list-style-type: none"> •“Rigid adherence to taught rules or plans” •No exercise of “discretionary judgment”
Advanced beginner	<ul style="list-style-type: none"> •Limited “situational perception” •All aspects of work treated separately with equal importance
Competent	<ul style="list-style-type: none"> •“Coping with crowdedness” (multiple activities, accumulation of information) •Some perception of actions in relation to goals •Deliberate planning •Formulates routines
Proficient	<ul style="list-style-type: none"> •Holistic view of situation •Prioritizes importance of aspects •“Perceives deviations from the normal pattern” •Employs maxims for guidance, with meanings that adapt to the situation at hand
Expert	<ul style="list-style-type: none"> •Transcends reliance on rules, guidelines, and maxims •“Intuitive grasp of situations based on deep, tacit understanding” •Has “vision of what is possible” •Uses “analytical approaches” in new situations or in case of problems

from all ACGME core specialties. Stakeholders expressed dissatisfaction with the inconsistencies in the milestones and subcompetencies. In fact, these differences were noted to have “complicated efforts to share assessment tools across programs, and provide comprehensive faculty development across specialties.” [6] It was concluded that these differences may hamper, rather than encourage, collaboration in assessment and faculty development activities across specialties.

In order to address these concerns, the ACGME Department of Milestone Development and Evaluation formalized a plan for the review and revision process. This work began in 2016 with a review of data collected from the field, the data submitted for the twice-yearly milestone reporting, and learning from quantitative and qualitative research. To date, more than 100 national and multi-institutional studies about the milestones have been completed, and a bibliography of milestone research is available on the ACGME website.

The quantitative research demonstrated validity evidence for key components of the milestones in several specialties [9]. Qualitative research has focused on program directors’ and trainees’ experience with the milestones, Clinical Competency Committee processes, the value of milestone-based feedback, and milestone design. A thematic analysis of the milestones for the non-PC and non-MK domains, completed in preparation for the revision process, demonstrated, as had already been stated, wide variation among specialties. The analysis showed that across the 26 core specialties and the transitional year, there were more than 230 different ways of describing PROF, 171 for PBLI, 176 for ICS, and 122 for SBP [10]. This early research on the milestones has helped inform the milestone revision process.

The many concerns regarding the differences in the non-PC and non-MK milestone content across specialties, prompted the ACGME to convene several groups to develop cross-specialty “harmonized” milestones for ICS, PBLI, PROF, and SBP. The groups consisted of content experts, directors, interprofessional team members, and other faculty. Each group developed 2 to 3 subcompetencies that were applicable to all specialties and subspecialties. Stakeholders across the specialties will be asked to edit the language, as needed. In 2017, the harmonized milestones were made available for public review and comment (Table 2).

It is important however to recognize that, throughout this process, much has remained the same. The current milestones are comprehensive and address all aspects of resident development. Key changes going forward are to reduce milestone complexity. It was universally felt that the complement of 34

Table 2 Subcompetencies for the harmonized milestones

Interpersonal and communication skills (ICS)	<ul style="list-style-type: none"> • Patient- and family-centered communication (ICS-1) • Interprofessional and team communication (ICS-2) • Communication within healthcare systems (ICS-3)
Practice-based learning and improvement (PBLI)	<ul style="list-style-type: none"> • Evidence-based and informed practice (PBLI-1) • Reflective practice and commitment to personal growth (PBLI-2)
Professionalism (PROF)	<ul style="list-style-type: none"> • Professional behavior and ethical principles (PROF-1) • Accountability/conscientiousness (PROF-2) • Self-awareness and help-seeking (PROF-3)
Systems-based practice (SBP)	<ul style="list-style-type: none"> • The physician’s role in healthcare systems (SBP-3) • Patient safety and quality improvement (SPB-1) • System navigation for patient-centered care (SBP-2)

milestone questions in urology is too long, leading to a decrease in formative faculty comments and feedback. In many cases, the final assessment was made by the CCC, using alternative evaluation tools to guide resident feedback (2019 SAU Taskforce Report., Sorenson, et al) [11].

Recent Steps to Improve the Milestones

In 2019, a group of volunteers gathered at ACGME headquarters in Chicago. Several program directors, as well as representation from the ABU, RRC, SAU, and ACGME, met to begin the development of Milestones 2.0. Several sessions over the next 12 months will be required to refine the 34 subcompetencies in urology. Both the number and the language will be reduced and simplified. The plan, going forward, is to reduce this number to approximately 20. Following the development of the revised milestones, program directors, faculty, residents, and others will have the opportunity to review and comment on the draft content.

Finally, to ensure that programs have the resources available to aid in implementation of the revised milestones, a Supplemental Guide will be created for each specialty to provide insights into the subcompetencies, with examples for each level, sample assessment methods, and other available resources. Additionally, an Implementation Guidebook that highlights planning, change management, and continuous quality improvement will be available in the summer of 2020. Review and revision of the milestones have begun, and there are 50 specialties in various stages of development, with more starting soon.

Resident Assessment and the Clinical Competency Committee Use of Supplemental Guide

Use of the new milestones will begin in the 2020–2021 academic year. Each program will be instructed to complete several activities in the summer of 2020. The first will be a thorough review of the new supplemental guide. The supplemental guide will include several features to aid programs and clinical competency committees (CCC) in their understanding and assessment of milestones. The development group explains the intent of each subcompetency and provides examples for each of the individual milestones. There will also be suggested assessment models, tools, and resources for the subcompetency. At the end of the supplemental guide is a general comparison of where the original milestones are incorporated into the revised version.

Each program must review the milestones and their current assessment tools. It is not expected that each program will revamp their method of assessment. However, programs will

need to ensure that the new milestones can be evaluated with their current assessment tools and make changes where required. Ideally, each subcompetency has the opportunity for several different evaluations by multiple evaluators every six months. In recognizing that this is not always possible, each program should ensure the broadest assessment feasible.

Once the assessment tools are identified, the CCC should meet to create a shared mental model around the new milestones. A word version of the supplemental guide will be available and serves as a basis to begin this process. The CCC should review each subcompetency, determine their expectations for each level, and document their decisions. The primary reason for each CCC to complete this activity is the context in which the residents are trained differ for every program.

Each program has a different population of patients and residents will have varied experiences. By completing the exercise, the CCC can begin each meeting with a shared decision-making model allowing for more time to be spent discussing the resident's next stages in the program.

Assessment is an activity that is expected of all faculty. Most faculty have not had training on the assessment tools they are using. It is recommended that the shared mental model exercise should also be completed using the various assessment tools. This exercise should include all faculty. Verify that the faculty are looking at the same activity in the same way and identifying the same actions in a similar manner. When faculty assessments are disparate, the resident is unable to use the information for improvement and the CCC has a more difficult time evaluating the milestones.

Residents need good feedback to establish learning plans and identify areas of strength and weakness. Feedback can be brief and informal or formal and cumulative. The new ACGME common program requirements state that milestones are to be incorporated into the semiannual evaluation process. Using the milestones for feedback can help the resident to create individualized learning plans. When programmatic data is also used, the feedback can help the resident to understand how they are meeting expectations and trends within the program. The annual ACGME Milestones National Report can also be shared with residents to see how they compare nationally.

Another element of assessment that is often overlooked is resident self-assessment with the milestones. The residents should complete the self-assessment each time the CCC is going to meet. The program director, or other faculty member, that shares the CCC results with the resident can compare both sets of assessment with the resident. This comparison is helpful for both the program and the resident. The program will have insight into the resident's understanding of their knowledge, skills, and attitudes (KSA). The resident will learn to calibrate their awareness of these same KSAs. This calibration will aid the resident when they enter practice, as they must

learn to assess their own KSAs with new techniques and treatments that will be developed.

As a reminder, milestone reports are available through the ACGME Accreditation Data System. Approximately two weeks after the close of each reporting session several reports are available, including the resident's most recent evaluations and longitudinal graphs.

Conclusion

As the milestones continue to mature, the intent is for the next review and revision to be in seven to ten years. However, as evidenced by the changes made in 2016, the milestones will be continuously reviewed and updated, as needed. A group of program directors will provide periodic feedback via surveys and focus groups, milestone data will be monitored annually, and formal surveys will be sent approximately five years after this most recent revision.

Much has been learned about the milestones over the past 5 years. The framework will remain the same, but version 2.0 will provide critical improvements. The goal is to ensure that the milestones are an effective tool for the assessment of residents and fellows across all specialties.

Compliance with Ethical Standards

Conflict of Interest Karim J. Hamawy and Laura Edgar each declare no potential conflicts of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors

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