



Rationale for Milestones

Readers' Guide

The abstracts in this document are organized by year of publication (in descending order). Readers with a particular interest in a subject may use the search function in the PDF to quickly find topics of their choosing. Please note that since the following content comes from a variety of sources, there may be variations in style and spelling. For official ACGME terminology and terminology usage, refer to the ACGME Glossary of Terms.

Background:

The Milestones were introduced to establish a common language for the professional growth of residents and fellow physicians across medical specialties and subspecialties. In July 2013, the ACGME incorporated the Milestones into residency programs for seven specialties, and since then, they have been integrated into accredited programs across all specialties in the United States.

The primary objective of the Milestones is to enhance the quality of educational experiences and evaluations for residents and fellows across a range of clinical teaching environments. The Milestones consist of descriptive narratives that outline the progression of resident and fellow competencies in each of the six Core Competencies, as defined by the ACGME and the American Board of Medical Specialties (ABMS):

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

Although these competencies are consistent across all medical specialties and subspecialties, the Milestones' developmental narratives are customized for each specialty and subspecialty.

What's in the literature?

- Rationale behind 1.0 to 2.0 revisions
- History and rationale supporting the Milestones and the development process
- How the Milestones aid in identifying deficiencies with regards to resident performance

Pediatric surgery milestones 2.0: A primer

Alaish SM, Arca MJ, Bucher BT, Cooney C, Diesen DL, Ehrlich PF, Gaines BA, Griggs CL, Javid PJ, Krishnaswami S, Middlesworth W, Wong CL, Edgar L. *J Pediatr Surg.* 2022 Dec;57(12):845-851. doi: 10.1016/j.jpedsurg.2022.04.021. Epub 2022 May 9. PMID: 35649748.

ABSTRACT:

More than twenty years ago, the Accreditation Council for Graduate Medical Education and the American Board of Medical Specialties began the conversion of graduate medical education from a structure- and process-based model to a competency-based framework. The educational outcomes assessment tool, known as the Milestones, was introduced in 2013 for seven specialties and by 2015 for the remaining specialties, including pediatric surgery. Designed to be an iterative process with improvements over time based on feedback and evidence-based literature, the Milestones started the evolution from 1.0 to 2.0 in 2016. The formation of Pediatric Surgery Milestones 2.0 began in 2019 and was finalized in 2021 for implementation in the 2022-2023 academic year. Milestones 2.0 are fewer in number and are stated in more straightforward language. It incorporated the harmonized milestones, subcompetencies for non-patient care and non-medical knowledge that are consistent across all medical and surgical specialties. There is a new Supplemental Guide that lists examples, references and links to other assessment tools and resources for each subcompetency. Milestones 2.0 represents a continuous process of feedback, literature review and revision with goals of improving patient care and maintaining public trust in graduate medical education's ability to self-regulate.

Part 5: Essentials of Neonatal-Perinatal Medicine Fellowship: evaluation of competence and proficiency using Milestones

Carbajal MM, Dadiz R, Sawyer T, Kane S, Frost M; ONTPD Fellowship Directors Writing Group; Angert R. *J Perinatol*. 2022 Jun;42(6):809-814. doi: 10.1038/s41372-021-01306-0. Epub 2022 Feb 11. PMID: 35149835.

ABSTRACT:

The Accreditation Council for Graduate Medical Education (ACGME) Pediatric Subspecialty Milestone Project competencies are used for Neonatal-Perinatal Medicine (NPM) fellows. Milestones are longitudinal markers that range from novice to expert (levels 1-5). There is no standard approach to the required biannual evaluation of fellows by fellowship programs, resulting in significant variability among programs regarding procedural experience and exposure to pathology during clinical training. In this paper, we discuss the opportunities that Milestones provide, potential strategies to address challenges, and future directions.

The Anesthesiology Milestones 2.0: An Improved Competency-Based Assessment for Residency Training

Ambardekar AP, Walker KK, McKenzie-Brown AM, Brennan K, Jackson C, Edgar L, Ellinas H, Long TR, Trombetta CE, Laskey MG, Wargo BW, Dainer RJ, Draconi CS, Mitchell JD. *Anesth Analg*. 2021 Aug 1;133(2):353-361. doi: 10.1213/ANE.0000000000005499. PMID: 33764340.

ABSTRACT:

The evolution of medical education, from a time-based to a competency-based platform, began nearly 30 years ago and continues to slowly take shape. The development of valid and reproducible assessment tools is the first step. Medical educators across specialties acknowledge the challenges and remain motivated to develop a relevant, generalizable, and measurable system. The Accreditation Council for Graduate Medical Education (ACGME) remains committed to its responsibility to the public by assuring that the process and outcome of graduate medical education in the nation's residency programs produce competent, safe, and compassionate doctors. The Milestones Project is the ACGME's current strategy in the evolution to a competency-based system, which allows each specialty to develop its own set of subcompetencies and 5-level progression, or milestones, along a continuum of novice to expert. The education community has now had nearly 5 years of experience with these rubrics. While not perfect, Milestones 1.0 provided important foundational information and insights. The first iteration of the Anesthesiology Milestones highlighted some mismatch between subcompetencies and current and future clinical practices. They have also highlighted challenges with assessment and evaluation of learners, and the need for faculty development tools. Committed to an iterative process, the ACGME assembled representatives from stakeholder groups within the Anesthesiology community to develop the second generation of Milestones. This special article describes the foundational data from Milestones 1.0 that was useful in the development process of Milestones 2.0, the rationale behind the important changes, and the additional tools made available with this iteration.

ACGME Diagnostic Radiology Milestones 2.0: the Time is Now

Grayev A, Catanzano TM, Sarkany D, Winkler N, Gaetke-Udager K, Mian A, Frederick J, Jordan SG. Acad Radiol. 2020 Dec 5;S1076-6332(20)30672-3. doi: 10.1016/j.acra.2020.11.020. Epub ahead of print. PMID: 33293257.

ABSTRACT:

The Accreditation Council for Graduate Medical Education oversees graduate medical education in the United States. Designed to provide broad based training in all aspects of imaging, the diagnostic radiology residency program must provide educational experiences that not only provide technical, professional, and patient centered training, but also meet accreditation standards. With the breadth of material to cover during training, carefully orchestrated educational experiences must be planned. This manuscript offers residency program leaders resources to meet the challenges of the new Accreditation Council for Graduate Medical Education Diagnostic Radiology Milestones 2.0 and highlights potential opportunities for future educational endeavors.

Sleep Medicine Milestones 2.0: designed for our field

Dredla BK, Edgar L, Samman H, Bagai K, Mohon R, Malkani R, Doo K, Zeidler M, Weir I, Kapur V, Shelgikar AV. J Clin Sleep Med. 2020 Nov 2. doi: 10.5664/jcsm.8962. Epub ahead of print. PMID: 33135628.

ABSTRACT:

The Accreditation Council for Graduate Medical Education (ACGME) published the first sleep medicine milestones in 2015. However, these milestones were the same among all internal medicine fellowship programs; they were not specific to the specialty. Based on stakeholder feedback, the ACGME called for the creation of specialty-specific milestones. Herein, we outline the history of ACGME reporting milestones, identification of knowledge, skills, and attitudes that define the practice of sleep medicine, and creation of the supplemental guide and sleep medicine-specific milestones (Sleep Medicine Milestones 2.0) to assess developmental progression during fellowship training.

Thoracic surgery milestones 2.0: Rationale and revision

Mitzman B, Beller JP, Edgar L. J Thorac Cardiovasc Surg. 2020 Nov;160(5):1399- 1404. doi: 10.1016/j.jtcvs.2019.12.132. Epub 2020 Mar 31. PMID: 32245669.

In 1999, the American Board of Medical Specialties and Accreditation Council for Graduate Medical Education (ACGME) jointly approved 6 core competencies aimed at providing a framework for developmental areas important for physicians in training. These were later launched as part of the Outcomes Project in 2001. The aim of this joint project was to improve the quality of graduate medical education through the avoidance of overspecialization while providing key developmental areas relevant to all specialties. The competencies include patient care and procedural skills, medical knowledge, professionalism, systems-based practice, interpersonal and communication skills, and practice-based learning and improvement. However, when first introduced, programs struggled with overall implementation of the competencies into individual training pathways and their application to different specialties. Many were unsure how to appropriately integrate the competencies into already- used evaluation models. In 2009, the ACGME introduced Milestones as part of the Next Accreditation System. To build on the initial competencies, subcompetencies were selected addressing a specific disease or discipline specific element. Milestones were developed as individual elements for each subcompetency. These milestones included a trajectory for a trainee to follow throughout their growth, with specific examples for the trainee's specialty. The expectation was that programs would identify and implement a variety of tools to assess their trainee's progress in acquiring these milestones. The actual tools used were left to the discretion of the programs. Twice each year, programs were required to report to the ACGME the progress their trainees were making in achieving their milestones. The ACGME is now in the process of updating the milestones as part of the Milestones 2.0 project. Thoracic Surgery is among the first subspecialty groups to near completion of the process. In the following, we describe the foundation for this work with the history of the initial milestone development and ongoing work for Milestones 2.0.

Developing microsurgical milestones for psychomotor skills in neurological surgery residents as an adjunct to operative training: the home microsurgery laboratory

Abecassis IJ, Sen RD, Ellenbogen RG, Sekhar LN. J Neurosurg. 2020 Sep 4:1-11. doi: 10.3171/2020.5. JNS201590. Epub ahead of print. PMID: 32886917.

OBJECTIVE:

A variety of factors contribute to an increasingly challenging environment for neurological surgery residents to develop psychomotor skills in microsurgical technique solely from operative training. While adjunct training modalities such as cadaver dissection and surgical simulation are embraced and practiced at our institution, there are no formal educational milestones defined to help residents develop, measure, and advance their microsurgical psychomotor skills in a stepwise fashion when outside the hospital environment. The objective of this report is to describe an efficient and convenient "home microsurgery lab" (HML) assembled and tested by the authors with the goal of supporting a personalized stepwise advancement of microsurgical psychomotor skills.

METHODS:

The authors reviewed the literature on previously published simulation practice models and designed adjunct learning modules utilizing the HML. Five milestones were developed for achieving proficiency with each graduated exercise, referencing the Accreditation Council for Graduate Medical Education (ACGME) guidelines. The HML setup was then piloted with 2 neurosurgical trainees.

RESULTS:

The total cost for assembling the HML was approximately \$850. Techniques for which training was provided included microinstrument handling, tissue dissection, suturing, and microanastomoses. Five designated competency levels were developed, and training exercises were proposed for each competency level.

CONCLUSIONS:

The HML offers a unique, entirely home-based, affordable adjunct to the operative neurosurgical education mandated by the ACGME operative case logs, while respecting resident hospital-based education hours. The HML provides surgical simulation with specific milestones, which may improve confidence and the microsurgical psychomotor skills required to perform microsurgery, regardless of case type.

Best Approaches to Evaluation and Feedback in Post-Graduate Medical Education

Perkins SQ, Dabaja A, Atiemo H. *Curr Urol Rep.* 2020 Aug 13;21(10):36. doi: 10.1007/s11934-020-00991-2. PMID: 32789759.

PURPOSE OF REVIEW:

The objectives of this literature review are to appraise current approaches and assess new technologies that have been utilized for evaluation and feedback of residents, with focus on surgical trainees.

RECENT FINDINGS:

In 1999, the Accreditation Council for Graduate Medical Education introduced the Milestone system as a tool for summative evaluation. The organization allows individual program autonomy on how evaluation and feedback are performed. In the past, questionnaire evaluations and informal verbal feedback were employed. However, with the advent of technology, they have taken a different shape in the form of crowdsourcing, mobile platforms, and simulation. Limited data is available on new methods but studies show promise citing low cost and positive impact on resident education. No one "best approach" exists for evaluation and feedback. However, it is apparent that a multimodal approach that is based on the ACGME Milestones can be effective and aid in guiding programs.

Competency-based Medical Education for the Clinician-Educator: The Coming of Milestones Version 2

Torralba KD, Jose D, Katz JD. Clin Rheumatol. 2020 Jun;39(6):1719-1723. doi: 10.1007/s10067-020-04942-7. Epub 2020 Feb 13.

ABSTRACT:

Competency-based medical education is emphasized by institutions overseeing medical school and postgraduate training worldwide. The high rate of preventable errors in medicine underscores this need. Expanding physician competency beyond the domains of patient care and medical knowledge towards goals that emphasize a more holistic view of the healthcare system is one aspect of this emphasis. The Accreditation Council on Graduate Medical Education (ACGME), which oversees postgraduate training programs in the USA, has recently expanded to oversee training programs internationally. The original ACGME Milestones effort unveiled in 2013 was met with skepticism. Nevertheless, other outcomes-based education programs worldwide, including the CanMEDS framework (Canada), Tomorrow's Doctor (UK), and Scottish Doctor (Scotland), have suggested that milestones do offer advantages. Missing from the milestone rollout, however, was collaborative buy-in from multiple stakeholders such as from clinician-educators. Consequently, Milestones version 2 is in development. Specifically, these will address the need for specialty-specific milestones, and the usage of harmonized milestones. A concise history of the push towards outcomes-based medical education is presented and contextualized for physicians who must embrace the transition from teacher-based to learner-based outcomes.

Linking Workplace-Based Assessment to ACGME Milestones: A Comparison of Mapping Strategies in Two Specialties

Kelleher M, Kinnear B, Wong SEP, O'Toole J, Warm E. Teach Learn Med. 2020 Apr-May;32(2):194-203. doi: 10.1080/10401334.2019.1653764. Epub 2019 Sep 18.

CONSTRUCT:

The construct that is assessed is competency in Pediatrics and Internal Medicine residency training. Background: The Accreditation Council for Graduate Medical Education (ACGME) created milestones to measure learner progression toward competence over time but not as direct assessment tools. Ideal measurement of resident performance includes direct observation and assessment of patient care skills in the workplace. Residency programs have linked these concepts by mapping workplace-based assessments to the milestones of ACGME subcompetencies. Mapping is a subjective process, and little is known about specific techniques or the resulting consequences of mapping program-specific assessment data to larger frameworks of competency.

APPROACH:

In this article, the authors compare and contrast the techniques used to link workplace-based assessments called Observable Practice Activities (OPAs) to ACGME subcompetencies in two large academic residency programs from different specialties (Internal Medicine and Pediatrics). Descriptive analysis explored the similarities and differences in the assessment data generated by mapping assessment items to larger frameworks of competency.

RESULTS:

Each program assessed the core competencies with similar frequencies. The largest discrepancy between the two subspecialties was the assessment of Medical Knowledge, which Internal Medicine assessed twice as often. Pediatrics also assessed the core competency Systems-based Practice almost twice as often as Internal Medicine. Both programs had several subcompetencies that were assessed more or less often than what appeared to be emphasized by the blueprint of mapping. Despite using independent mapping processes, both programs mapped each OPA to approximately three subcompetencies.

CONCLUSIONS:

Mapping workplace-based assessments to the ACGME subcompetencies allowed each program to see the whole of their curricula in ways that were not possible before and to identify existing curricular and assessment gaps. Although each program used similar assessment tools, the assessment data generated were different. The lessons learned in this work could inform other programs attempting to link their own workplace-based assessment elements to ACGME subcompetencies.

Statement From the Society for the Advancement of Transplant Anesthesia: White Paper Advocating Desirable Milestones and Competencies for Anesthesiology Fellowship Training in the Field of Lung Transplantation

Wilkey BJ, Abrams BA, Del Rio JM, Kertai MD, Subramaniam K, Srinivas C, Peng YG, Berrio-Valencia M, Martin AK. *Semin Cardiothorac Vasc Anesth.* 2020 Mar;24(1):104-114. doi: 10.1177/1089253219867695. Epub 2019 Aug 8.

ABSTRACT:

The clinical, educational, and research facets of lung transplantation have advanced significantly since the first lung transplant in 1963. The formation of the International Society for Heart and Lung Transplantation (ISHLT) and subsequent Registry has forged a precedent of collaborative teamwork that has significantly affected current lung transplantation outcomes. The Society for the Advancement of Anesthesia (SATA) is dedicated to developing educational platforms for all facets of transplant anesthesia. Additionally, we believe that the anesthetic training for lung transplantation has not kept pace with other advances in the field. As such, SATA presents for consideration these educational milestones and competencies for anesthetic fellowship training in the field of lung transplantation. The proposed milestones were designed on the framework of 6 core competencies created by the Accreditation Council on Graduate Medical Education. The milestones were identified by combining the expert opinion of our Thoracic Transplant Committee, our experience as educators, and literature review. We offer this White Paper to the anesthesiology and transplant communities as a starting point for the discussion and evolution of perioperative anesthetic care in the field of lung transplantation.

Cytopathology Milestones: Can You Get to Level 5?

Dyhdalo KS, Oshilaja O, Chute DJ, Booth CN, Suchy P, Smith K, Procop GW, Reynolds JP. J Am Soc Cytopathol. 2020 Mar 30. pii: S2213-2945(20)30046-6. doi: 10.1016/j.jasc.2020.03.002. [Epub ahead of print]

INTRODUCTION:

ACGME Milestones describe 6 areas of proficiency, indicating readiness for practice. Each is divided into 5 levels of mastery; Level 1 (new trainees) through Levels 4 (graduation) and 5 (aspirational). Milestones reporting began Spring 2016. We used Milestones to assess graduated fellows.

MATERIALS AND METHODS:

We conducted phone interviews with previous fellows and collected demographic information including practice setting. We asked graduates if they fulfilled each example of mastery and recorded their answers.

RESULTS:

A total of 22 fellows graduated from 2010 to 2017; 15 responded (10 academic, 5 private). Milestones in which nearly all respondents performed well (Level 4+) were: PC1, MK1, SBP2, SBP4, PROF1-4, ICS1-3. Some were more challenging (PC2, MK2, SBP1/3/5, PBL1). For PC2, 2 respondents achieved Level 1 (did not perform fine-needle aspirations). For MK2, 2 respondents achieved Level 1 (did not evaluate Papanicolaou). For SBP1, 80% in private practice achieved Level 5; 50% in academics achieved Level 3. For SBP3, 80% in private practice achieved Level 4+; 100% in academics achieved maximum Level 2. For SBP5, 60% of all respondents achieved maximum Level 3; only 1 achieved Level 5.

CONCLUSIONS:

Many Milestones are attainable. Eleven of 18 yielded Level 4+ from most respondents. Three (PC2, MK1, MK2) yielded rare Level 1 due to scope of practice. Others (SBP1, SBP3) reflect more of an all-or-nothing phenomenon. For SBP5, most respondents achieved Level 3; only 1 achieved Level 5. Some Milestones are highly dependent on practice setting, and others remain aspirational.

A National Survey of Integrated Vascular Surgery Residents' Experiences With and Attitudes About Quality Improvement During Residency

Purnell SM, Wolf L, Millar MM, Smith BK. *J Surg Educ.* 2020 Jan - Feb;77(1):158-165. doi: 10.1016/j.jsurg.2019.09.003. Epub 2019 Dec 4

BACKGROUND:

Integrated vascular surgery residency, or "0+5," programs provide education in the Accreditation Council for Graduate Medical Education (ACGME) competencies of Systems-Based Practice (SBP) and Practice-Based Learning and Improvement (PBLI), which include milestones related to quality improvement (QI). It is unclear what QI curricula are in place in 0+5 programs nationally or how 0+5 residents perceive the importance of QI.

OBJECTIVE:

The purpose of this study is to assess current 0+5 residents' knowledge, experiences with, and attitudes about QI.

DESIGN:

A survey was developed using the ACGME Common Program Requirements and Milestones pertaining to QI. All 0+5 residents from 2017 to 2018 academic year were emailed an electronic link to the survey. Descriptive statistics and cross-tabulations were calculated using Stata/MP version 13.1.

SETTING:

All 0+5 vascular surgery residency programs in the United State (n = 52).

PARTICIPANTS:

The survey was completed by 35% (n = 90/257) of 0+5 residents, representing 75% of 0+5 programs in the United States (n = 39/52).

RESULTS:

Forty-one percent of respondents felt that applying QI methods is very important and 33% felt that QI education is very important for their future work, however, just 13% felt very prepared to lead a QI initiative. Residents' perceptions of preparedness to lead QI projects and the importance they attached to QI education were significantly influenced by their participation in a QI project (p = 0.003 and p = 0.038 respectively). Finally, just 8% (n = 6) of residents responded correctly to all 13 knowledge-based questions and these residents felt better prepared to lead a QI initiative compared to those who answered incorrectly (p = 0.002).

CONCLUSIONS:

Most 0+5 residents report participation in a QI project during residency, however, few feel prepared to lead a QI initiative in practice. Furthermore, only half of PGY5 0+5 residents report achieving specific ACGME targets for graduation pertaining to QI. Current QI curricula in 0+5 programs may be inadequate in teaching fundamental QI concepts and achieving ACGME competency targets for graduation.

Orthopaedic Surgery Residency Milestones: Initial Formulation and Future Directions

Ames SE, Ponce BA, Marsh JL, Hamstra SJ. J Am Acad Orthop Surg. 2020 Jan 1;28(1):e1-e8. doi: 10.5435/JAAOS-D-18-00786.

ABSTRACT:

Milestones specific to orthopaedic surgical training document individual resident progress through skill development in multiple dimensions. Residents increasingly interact with and are assessed by surgeons in both academic and private practice environments. Milestones describe the skills that support competence. One of the primary goals of milestones is to provide continuous data for educational quality improvement of residency programs. They provide a dialogue between surgeons who supervise residents or fellows and the program's Clinical Competency Committee throughout a resident's education. The orthopaedic milestones were developed jointly by the Accreditation Council for Graduate Medical Education and the American Board of Orthopaedic Surgery. The working team was designed with broad representation within the specialty. The milestones were introduced to orthopaedic residencies in 2013. Orthopaedics is a 5-year training program; the first comprehensive longitudinal data set is now available for study. This summary provides historical perspective on the development of the milestones, state of current milestone implementation, attempts to establish validity, challenges with the milestones, and the development of next-generation assessment tools.

Urology Milestones 2.0: The Future Looks Bright

Hamawy KJ, Edgar L. *Curr Urol Rep.* 2019 Nov 28;20(12):85. doi: 10.1007/s11934-019-0946-9.

ABSTRACT:

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. 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.

Core Competencies for Pediatric Consultation-Liaison Psychiatry in Child and Adolescent Psychiatry Fellowship Training

Shaw RJ, Rackley S, Walker A, Fuchs DC, Meadows A, Dalope K, Pao M; Special Interest Study Group for Pediatric Consultation Liaison Psychiatry Core Competencies, Physically Ill Child Committee, American Academy of Child and Adolescent Psychiatry. *Psychosomatics*. 2019 Sep - Oct;60(5):444-448. doi: 10.1016/j.psym.2019.04.006. Epub 2019 May 3

BACKGROUND:

Learners developing competency-based skills, attitudes, and knowledge through the achievement of defined milestones is a core feature of competency-based medical education. In 2017, a special interest study group of the American Academy of Child and Adolescent Psychiatry convened a panel of specialists to describe pediatric consultation-liaison psychiatry (CLP) best educational practices during child and adolescent psychiatry fellowship.

OBJECTIVE:

The objective of this project was to develop a national consensus on pediatric CLP competencies to help guide training in this specialty.

METHODS:

An expert working group developed a list of candidate competences based on previously established educational outcomes for CLP (formerly Psychosomatic Medicine), child and adolescent psychiatry, and general psychiatry. A survey was distributed to members of the American Academy of Child and Adolescent Psychiatry Physically Ill Child Committee to determine child and adolescent psychiatry fellowship educational needs on pediatric CLP services and generate consensus regarding pediatric CLP competencies.

RESULTS:

Most survey respondents were supportive of the need for a national consensus on core competencies for pediatric CLP. Consensus from a panel of experts in the field of pediatric CLP generated a list of proposed core competencies that track the Accreditation Council for Graduate Medical Education's six core competencies.

CONCLUSIONS:

Consistent learning outcomes provide the foundation for further development of tools to support training in pediatric CLP. There is a need to develop further tools including outcome assessment instruments and self-directed learning materials that can be used to support lifelong learning.

Milestones on the Plastic Surgery In-Service Training Examination

Ganesh Kumar N, Marwaha J, Drolet BC. J Surg Educ. 2019 Sep - Oct;76(5):1370-1375. doi: 10.1016/j.jsurg.2019.03.014. Epub 2019 Apr 5.

BACKGROUND:

The Plastic Surgery Milestones Project was implemented in 2014 to establish standards for competency based resident education. In restructuring educational activities under the Milestones, various pedagogical tools have been revised. However, these standards have not yet been applied to the Plastic Surgery In-Service Training Examination. The purpose of this study was to determine the representation of the various components of the Plastic Surgery Milestones Project, on the In-Service Training Examination.

METHODS:

All questions from the 2014 - 2018 In-Service Examinations were evaluated within the framework of the current Plastic Surgery Milestones. Using content analysis, each Examination question was mapped to a single Milestone. Descriptive analysis of Milestone subject area and Core Competency breakdown, as well as year to year trends, were performed.

RESULTS:

Of the 1,150 questions analyzed, there was an unequal representation of individual Milestones (0-7.4%). Of the 36 Plastic Surgery Milestones, 10 represented more than 50% of the PSITEs while 8 Milestones had less than 1% representation. The most common subject area was Head and Neck (12.7%) and least common was Reconstruction of the Trunk and Perineum. Among Core Competencies, more than half (50.4%) tested Patient Care while Interpersonal and Communication Skills was the lowest represented, 0.2%.

CONCLUSIONS:

The Plastic Surgery In-Service Examination tests a variable proportion of Milestones. Currently, the PSITE is not well integrated with competency based education in spite of a shift towards such a training model. Going forward, the PSITE may include an associated Milestone with each question in order to better incorporate Competencies into this important annual evaluation metric.

Society for Neuroscience in Anesthesiology & Critical Care (SNACC) Neuroanesthesiology Education Milestones for Resident Education

Sharma D, Easdown LJ, Zolyomi A, Ayrian E, Wheeler PJ, Edelman G, Mahla ME; Society for Neuroscience in Anesthesiology & Critical Care (SNACC) Neuroanesthesiology Milestones Task Force. *J Neurosurg Anesthesiol.* 2019 Jul;31(3):337-341. doi: 10.1097/ANA.0000000000000586.

BACKGROUND:

The Accreditation Council for Graduate Medical Education (ACGME) has introduced competency- based assessments (milestones) for resident education. However, the existing milestones for Anesthesiology are not specific to Neuroanesthesiology. The Society for Neuroscience in Anesthesiology & Critical Care (SNACC) commissioned a task force to adapt the ACGME anesthesiology milestones for use in Neuroanesthesiology training, and to provide recommendations for implementing milestones.

METHODS:

A 7-member expert task force supported by an advisory committee developed the initial milestones by consensus. Written permission was given by the ACGME. The milestones were refined following 3-month pilot use in 14 departments across the United States and inputs from SNACC members. Final milestones were approved by the SNACC Board of Directors.

RESULTS:

Twelve Neuroanesthesiology-specific milestones in 5 major ACGME domains are recommended; these were identified as most pertinent to this subspecialty rotation. These pertain to patient care (7 milestones), medical knowledge (2 milestones), practice-based learning and improvement (1 milestone), and interpersonal and communication skills (2 milestones). Each milestone was described in detail, with clear outline of expectations at various levels of training.

CONCLUSIONS:

The SNACC Neuroanesthesiology milestones provide a framework for reviewing resident performance and are expected to facilitate improved use of ACGME milestones during Neuroanesthesiology subspecialty training. The task force recommends that the target should be to accomplish level 4 or higher milestones by the end of residency training. Individual programs should decide the implications of a resident not meeting the expected milestones.

Resident Education in Complex Obstetric Procedures: Are We Adequately Preparing Tomorrow's Obstetricians?

Dotters-Katz SK, Gray B, Heine RP, Propst K. Am J Perinatol. 2019 Jun 25. doi: 10.1055/s- 0039-1692714.

OBJECTIVES:

The Accreditation Council for Graduate Medical Education (ACGME) milestones for obstetrics and gynecology (OB/GYN) residents include obstetrical technical skills. We sought to describe resident experience with surgical obstetrics and comfort performing procedures independently postgraduation.

STUDY DESIGN:

An anonymous 27-question e-survey was sent to OB/GYN residents in United States in March 2018, using the Council of Resident Education in Obstetrics and Gynecology coordinator listserv. Complex obstetric procedures included: forceps-assisted vaginal delivery (FAVD) and vacuum-assisted vaginal delivery (VAVD), cerclage, breech second twin, breech delivery, perineal repairs, and cesarean hysterectomy. Technical skill questions included experience as primary surgeon, comfort performing procedures independently, and for 4th year residents- comfort performing procedures postresidency. Demographic information was queried. Descriptive statistics was used to analyze responses.

RESULTS:

A total of 417 residents completed the survey. Respondents were 88% female, 75% from academic programs, and 48% postgraduate year 3 and 4. Among all residents, many had been primary surgeon in operative vaginal deliveries (51% FAVD, 72% VAVD), fewer for breech vaginal delivery (21%), breech second twin (34%), cesarean hysterectomy (21%), and 4th degree repairs (37%). All 4th-year respondents stated that they would feel comfortable performing either VAVD or FAVD postresidency. Note that 17, 33, 28, and 74% would not feel comfortable performing a 4th degree repair, cesarean hysterectomy, breech second twin, and breech vaginal delivery, respectively, postresidency.

CONCLUSION:

Despite ACGME recommendations, data suggest that many graduating residents may not be comfortable with these complex procedures.

Development of Curricular Milestones for Hospice and Palliative Medicine Fellowship Training in the US

Gustin JL, Yang HB, Radwany SM, Okon TR, Morrison LJ, Levine SK, Hwang JM, Buckholz GT, Barnett MD, Verbeck N, Landzaat LH. *J Pain Symptom Manage*. 2019 May;57(5):1009-1017.e6. doi: 10.1016/j.jpainsymman.2019.02.013. Epub 2019 Feb 18.

CONTEXT:

A physician workgroup of the American Academy of Hospice and Palliative Medicine sought to define curricular milestones (CMs) for hospice and palliative medicine (HPM) Fellowship Programs. The developed list of CMs would serve as components upon which to organize curriculum and standardize what to teach during training. These would complement entrustable professional activities previously developed by this group and new specialty-specific reporting milestones (RMs) for HPM developed through the Accreditation Council for Graduate Medical Education.

OBJECTIVES:

The objective of this study was to develop and vet CMs for HPM fellowships in the U.S.

METHODS:

A draft of CMs was developed through an iterative consensus group process with repeated cycles of drafting, analyzing, and revising by a broadly representative expert workgroup who then gained input from HPM educators at a national meeting workshop. The CM draft was subsequently revised and then vetted through a national survey to 203 fellowship educators. Respondents were asked to "keep," "revise," or "exclude" each proposed CM with space for comments. An agreement of 75% among respondents was set as the criteria a priori for keeping a CM. Eighty-four of the 203 potential respondents participated in the survey. All items met the minimum agreement level of 75% or greater recommending keeping the CM. Greater than 85% of the respondents agreed to keep 19 of the 22 CMs with no revisions. Comments for revisions on other CMs were primarily related to changes in language and formatting, not conceptual underpinnings.

CONCLUSION:

A group consensus method strengthened by inclusion of a national survey to HPM fellowship educators resulted in a CM document that is both carefully developed and broadly vetted. Along with entrustable professional activities and new specialty-specific RMs, these CMs offer educators and trainees tools to create more comprehensive curricula and behaviorally based assessment tools for HPM fellowships and their stakeholders.

Use of Emergency Department Pharmacists in Emergency Medicine Resident Milestone Assessment

Bedy SC, Goddard KB, Stilley JAW, Sampson CS. West J Emerg Med. 2019 Mar;20(2):357-362. doi: 10.5811/westjem.2018.10.37958. Epub 2018 Dec 5.

INTRODUCTION:

The use of competency-based milestones for emergency medicine (EM) was mandated by the Accreditation Council for Graduate Medical Education in 2013. However, clinical competency committees (CCC) may lack diverse, objective data to assess these new competencies. To remedy the lack of objective data when assessing the pharmacotherapy sub-competency (PC5) we introduced a unique approach that actively involves departmental clinical pharmacists in determining the milestone level achieved by the resident.

METHODS:

Our pharmacists assess the pharmacotherapy knowledge of the residents through multiple methods: direct observation of orders, communication with the residents while performing patient care within the emergency department (ED), and real-time chart review. This observation occurs informally on a daily basis in the ED and is incorporated into the routine work of the pharmacist. The pharmacists use the PC5 sub-competency as their standard evaluation tool in this setting to keep all assessments consistent.

RESULTS:

Since our residency program introduced pharmacist assessment of resident pharmacotherapy knowledge, the CCC has conducted seven biannual meetings. Of the 120 separate PC5 sub-competency assessments made during those meetings there was 100% agreement between the pharmacist's assessment and the CCC's final assessment of the trainee. A survey of the CCC members concluded that the pharmacists' assessments were useful and aided in accurate resident evaluation.

CONCLUSION:

The use of ED pharmacists in assessing the pharmacotherapy sub-competency provides important information used in resident assessment of the PC5 milestone.

ACGME Milestones within Subspecialty Training Programs: One Institution's Experience

Heath JK, Dine CJ. J Grad Med Educ. 2019 Feb;11(1):53-59. doi: 10.4300/JGME-D-18-00308.1.

BACKGROUND:

The Accreditation Council for Graduate Medical Education Milestones were created as a criterion-based framework to promote competency-based education during graduate medical education.

Despite widespread implementation across subspecialty programs, extensive validity evidence supporting the use of milestones within fellowship training is lacking.

OBJECTIVE:

We assessed the construct and response process validity of milestones in subspecialty fellowship programs in an academic medical center.

METHODS:

From 2014-2016, we performed a single center retrospective cohort analysis of milestone data from fellows across 5 programs. We analyzed summary statistics and performed multivariable linear regression to assess change in milestone ratings by training year and variability in ratings across fellowship programs. Finally, we examined a subset of Professionalism and Interpersonal and Communication Skills subcompetencies from the first 6 months of training to identify the proportion of fellows deemed "ready for independent practice" in these domains.

RESULTS:

Milestone data were available for 68 fellows, with 75933 unique subcompetency ratings.

Multivariable linear regression, adjusted for subcompetency and subspecialty, revealed an increase of 0.17 (0.16-0.19) in ratings with each postgraduate year level increase ($P < .005$), as well as significant variation in milestone ratings across subspecialties. For the Professionalism and Interpersonal and Communication Skills domains, mean ratings within the first 6 months of training were 3.78 and 3.95, respectively.

CONCLUSIONS:

We noted a minimal upward trend of milestone ratings in subspecialty training programs, and significant variability in implementing milestones across differing subspecialties. This may suggest possible difficulties with the construct validity and response process of the milestone system in certain medical subspecialties.

Transforming Resident Assessment: An Analysis Using Deming's System of Profound Knowledge

Warm EJ, Kinnear B, Kelleher M, Sall D, Holmboe E. Acad Med. 2019 Feb;94(2):195-201. doi: 10.1097/ACM.0000000000002499.

ABSTRACT:

W. Edwards Deming, in his System of Profound Knowledge, asserts that leaders who wish to transform a system should understand four essential elements: appreciation for a system, theory of knowledge, knowledge about variation, and psychology. The Accreditation Council for Graduate Medical Education (ACGME) introduced the milestones program as a part of the Next Accreditation System to create developmental language for the six core competencies and facilitate programmatic assessment within graduate medical education systems. Viewed through Deming's lens, the ACGME can be seen as the steward of a large system, with everyone who provides assessment data as workers in that system. The authors use Deming's framework to illustrate the working components of the assessment system of the University of Cincinnati College of Medicine's internal medicine residency program and draw parallels to the macrocosm of graduate medical education. Successes and failures in transforming resident assessment can be understood and predicted by identifying the system and its aims, turning information into knowledge, developing an understanding of variation, and appreciating the psychology of motivation of participants. The authors offer insights from their experience for educational leaders who wish to apply Deming's elements to their own assessment systems, with questions to explore, pitfalls to avoid, and practical approaches in doing this type of work.

Integration of Entrustable Professional Activities with the Milestones for Emergency Medicine Residents

Hart D, Franzen D, Beeson M, Bhat R, Kulkarni M, Thibodeau L, Weizberg M, Promes S. West J Emerg Med. 2019 Jan;20(1):35-42. doi: 10.5811/westjem.2018.11.38912. Epub 2018 Nov 30.

INTRODUCTION:

Medical education is moving toward a competency-based framework with a focus on assessment using the Accreditation Council for Graduate Medical Education Milestones. Assessment of individual competencies through milestones can be challenging. While competencies describe characteristics of the person, the entrustable professional activities (EPAs) concept refers to work-related activities. EPAs would not replace the milestones but would be linked to them, integrating these frameworks. Many core specialties have already defined EPAs for resident trainees, but EPAs have not yet been created for emergency medicine (EM). This paper describes the development of milestone-linked EPAs for EM.

METHODS:

Ten EM educators from across North America formed a consensus working group to draft EM EPAs, using a modified Glaser state-of-the-art approach. A reactor panel with EPA experts from the United States, Canada and the Netherlands was created, and an iterative process with multiple revisions was performed based on reactor panel input. Following this, the EPAs were sent to the Council of Residency Directors for EM (CORD-EM) listserv for additional feedback.

RESULTS:

The product was 11 core EPAs that every trainee from every EM program should be able to perform independently by the time of graduation. Each EPA has associated knowledge, skills, attitudes and behaviors (KSAB), which are either milestones themselves or KSABs linked to individual milestones. We recognize that individual programs may have additional focus areas or work-based activities they want their trainees to achieve by graduation; therefore, programs are also encouraged to create additional program-specific EPAs.

CONCLUSION:

This set of 11 core, EM-resident EPAs can be used as an assessment tool by EM residency programs, allowing supervising physicians to document the multiple entrustment decisions they are already making during clinical shifts with trainees. The KSAB list within each EPA could assist supervisors in giving specific, actionable feedback to trainees and allow trainees to use this list as an assessment- for- learning tool. Linking each KSAB to individual EM milestones allows EPAs to directly inform milestone assessment for clinical competency committees. These EPAs serve as another option for workplace- based assessment, and are linked to the milestones to create an integrated framework.

Surgical Equipment and Medication Price Awareness amongst Obstetrician Gynecologists

Nguyen M, Gray K, Steck-Bayat K, Mahnert N. Surgical Equipment and Medication Price Awareness Amongst Obstetrician Gynecologists [16P]. *Obstetrics and Gynecology*. 2019;174. doi:10.1097/01.AOG.0000558904.75557.d6.

INTRODUCTION:

Milestones established in 2013 by the Accreditation Council for Graduate Medical Education (ACGME) supports the addition of a systems-based practice milestone to assess residents' incorporation of cost awareness into clinical judgment and decision making. Minimal formal education is provided to residents regarding costs related to medications and devices. The primary aim of this study was to evaluate teaching faculty and obstetrical learners accuracy at estimating the costs of common obstetrical devices and medications.

METHODS:

After an IRB was approved, an anonymous survey was distributed to OB/GYN residents and attendings with teaching privileges at University affiliated Banner Health hospitals in Arizona. Participants were asked to provide demographic data and rate statements related to cost awareness pertaining to patient care in addition to estimates of cost of commonly used of surgical equipment and medications based on images. Statistical analyses was then performed on the data.

RESULTS:

The subjective survey showed that the majority of respondents felt that cost was important in the selection of surgical devices/items, that surgical device pricing should be transparent, and that their personal knowledge on prices of surgical devices/medications at the institution was below average or poor. The statistical analysis was consistent with this assessment as the majority of respondents were not able to accurately estimate the pricing of items within a 10% range.

CONCLUSION:

At academic institutions, where cost awareness is expected to be a part of residency training, better methods to educate teaching attendings and residents should be considered to make ACGME milestone assessments more accurate and meaningful.

Competencies, Milestones, and a Level of Supervision Scale for Entrustable Professional Activities for Scholarship

Mink RB, Myers AL, Turner DA, Carraccio CL. Acad Med. 2018 Nov;93(11):1668- 1672. doi: 10.1097/ACM.0000000000002353.

PROBLEM:

Scholarship is an important element of both undergraduate and graduate medical education, and scholarly activity is required for all pediatric fellows. However, despite the creation of entrustable professional activities (EPAs) for scholarship, the specific progressive levels of performance and the appropriate level of supervision for a given performance level have not been defined. The authors developed competencies and milestones for the scholarship EPA to provide a framework for assessment across the continuum; a level of supervision scale was also developed.

APPROACH:

The Vitae Researcher Development Framework served as a template to create the competencies and milestones for the scholarship EPA. Beginning in September 2015 and using a modified Delphi approach, three distinct drafts were circulated to individuals with expertise in various types of scholarship until broad agreement was achieved. Then, in October 2016, the Steering Committee of the Subspecialty Pediatrics Investigator Network created a level of supervision scale, modeled after one it had previously developed.

OUTCOMES:

Eight competencies were identified as important in making entrustment decisions related to scholarship. For each competency, five milestone levels that span the continuum from novice to expert were created. A supervision scale with five progressive levels of entrustment was also created.

NEXT STEPS:

Next steps include a study to obtain validity evidence for the supervision scale and determine the correlation between milestone and supervision levels. These competencies, milestones, and supervision levels can potentially serve as a roadmap for trainees and junior faculty and also play a role in the assessment of physician-scientists.

Ten Commandments for Neonatal-Perinatal Medicine Fellows

Chabra S, Sawyer T. J Med Educ Curric Dev. 2018 Sep 19;5:2382120518798639. doi: 10.1177/2382120518798639. eCollection 2018 Jan-Dec.

ABSTRACT:

The transformation of a general pediatrician into a neonatologist requires rigorous training in a diverse range of core skills during neonatal-perinatal medicine fellowship. This training includes the care of high-risk newborn infants, as well as interdisciplinary communication with care team members and families in the neonatal intensive care unit. In addition, neonatal-perinatal medicine fellows need to acquire competency in key procedural skills, including neonatal resuscitation techniques, to be able to safely practice neonatology without direct supervision on graduation. Although there is much general advice available to help residents and fellows navigate training, there is little specific advice or guidance for neonatal fellows. In this *Perspective*, we present 10 commandments for neonatal fellows. The commandments include (1) cherish your patients and their families, (2) know your limits and seek help when needed, (3) understand competency-based medical education, (4) remember the 6 core competencies, (5) review your specialty milestones, (6) have an individualized learning plan, (7) seek out feedback, (8) honor your attendings and nurses, (9) appreciate the importance of teamwork, and (10) do not take thyself in vain. These commandments were developed based on the experience of the authors, working closely with neonatal fellows over several decades. The commandments are present not as unbreakable rules, but rather as words of advice from 2 neonatologists who, having completed their neonatal fellowship, want to help guide others do the same. We believe that this resource will be useful to fellowship programs and neonatal-perinatal fellows.

Competency Crosswalk: A Multispecialty Review of the Accreditation Council for Graduate Medical Education Milestones Across Four Competency Domains

Edgar L, Roberts S, Yaghmour N, Hunderfund AL, Hamstra SJ, Conforti L, Holmboe ES. Acad Med. 2018 Jul;93(7):1035-1041. doi: 10.1097/ACM.0000000000002059.

PURPOSE:

To identify common and overlapping themes among the interpersonal and communication skills (ICS), practice-based learning and improvement (PBLI), professionalism (PROF), and systems-based practice (SBP) milestones of the transitional year and 26 specialties.

METHOD:

In May 2017, milestones were accessed from the Accreditation Council for Graduate Medical Education specialties website. A thematic analysis of the ICS, PBLI, PROF, and SBP milestones was performed to determine unique and common themes across these competencies and across specialties. Keywords from the common program requirements were initially applied as codes to the milestones. Codes were then grouped into common themes.

RESULTS:

Twenty-two themes were identified: 15 (68%) were unique to a given competency (3 related to ICS, 4 related to PBLI, 5 related to PROF, and 3 related to SBP), and 7 (32%) appeared in the milestones of more than one core competency. Eleven themes (50%) were used by 20 or more specialties, and 6 themes (27%) by 10 or fewer specialties. No theme was present across all specialties.

CONCLUSIONS:

The ICS, PBLI, PROF, and SBP milestones contain multiple themes with areas of overlap among these four competencies and substantial variability across specialties. This variability may create differential expectations of residents across specialties, complicate faculty development, and make sharing assessment tools difficult. The thematic analysis provides important insights into how individual specialties interpret and operationalize the ICS, PBLI, PROF, and SBP competency domains and can inform future revisions of milestones to enable harmonization and shared understanding of these competencies across specialties where appropriate.

Evaluating Surgical Residents' Patient-Centered Communication Skills: Practical Alternatives to the "Apprenticeship Model"

Newcomb A, Trickey AW, Lita E, Dort J. J Surg Educ. 2018 May - Jun;75(3):613-621. doi: 10.1016/j.jsurg.2017.09.011. Epub 2017 Oct 7.

OBJECTIVES:

The Accreditation Council for Graduate Medical Education (ACGME) requires residency programs to assess communication skills and provide feedback to residents. We aimed to develop a feasible data collection process that generates objective clinical performance information to guide training activities, inform ACGME milestone evaluations, and validate assessment instruments.

DESIGN:

Residents care for patients in the surgical clinic and in the hospital, and participate in a communication curriculum providing practice with standardized patients (SPs). We measured perception of resident communication using the 14-item Communication Assessment Tool (CAT), collecting data from patients at the surgery clinic and surgical wards in the hospital, and from SP encounters during simulated training scenarios. We developed a handout of CAT example behaviors to guide patients completing the communication assessment.

SETTING:

Independent academic medical center.

PARTICIPANTS:

General surgery residents.

RESULTS:

The primary outcome is the percentage of total items patients rated "excellent;" we collected data on 24 of 25 residents. Outpatient evaluations resulted in significantly higher scores (mean 84.5% vs. 68.6%, $p < 0.001$), and female patients provided nearly statistically significantly higher ratings (mean 85.2% vs. 76.7%, $p = 0.084$). In multivariate analysis, after controlling for patient gender, visit reason, and race, (1) residents' CAT scores from SPs in simulation were independently associated with communication assessments in their concurrent patient population ($p = 0.017$), and (2) receiving CAT example instructions was associated with a lower percentage of excellent ratings by 9.3% ($p = 0.047$).

CONCLUSIONS:

Our data collection process provides a model for obtaining meaningful information about resident communication proficiency. CAT evaluations of surgical residents by the inpatient population had not previously been described in the literature; our results provide important insight into relationships between the evaluations provided by inpatients, clinic patients, and SPs in simulation. Our example behaviors guide shows promise for addressing a common concern, minimizing ceiling effects when measuring physician-patient communication.

Teaching and Assessing Professionalism in Radiology: Resources and Scholarly Opportunities to Contribute to Required Expectations

Kelly AM, Mullan PB. *Acad Radiol*. 2018 May;25(5):599-609. doi: 10.1016/j.acra.2018.01.008. Epub 2018 Mar 1.

ABSTRACT:

Teaching and assessing trainees' professionalism now represents an explicit expectation for Accreditation Council Graduate Medical Education-accredited radiology programs. Challenges to meeting this expectation include variability in defining the construct of professionalism; limits of traditional teaching and assessment methods, used for competencies historically more prominent in medical education, for professionalism; and emerging expectations for credible and feasible professionalism teaching and assessment practices in the current context of health-care training and practice. This article identifies promising teaching resources and methods that can be used strategically to augment traditional teaching of the cognitive basis for professionalism, including role modeling, case-based scenarios, debriefing, simulations, narrative medicine (storytelling), guided discussions, peer-assisted learning, and reflective practice. This article also summarizes assessment practices intended to promote learning, as well as to inform how and when to assess trainees as their professional identities develop over time, settings, and autonomous practice, particularly in terms of measurable behaviors. This includes assessment tools (including mini observations, critical incident reports, and appreciative inquiry) for authentic assessment in the workplace; engaging multiple sources (self-peer, other health professionals, and patients) in assessment; and intentional practices for trainees to take responsibility for seeking our actionable feedback and reflection. This article examines the emerging evidence of the feasibility and value added of assessment of medical competency milestones, including professionalism, coordinated by the Accreditation Council Graduate Medical Education in radiology and other medical specialties. Radiology has a strategic opportunity to contribute to scholarship and inform policies in professionalism teaching and assessment practices.

The American Society of Hematology and ASCO Curricular Milestones for Assessment of Fellows in Hematology/Oncology: Development, Reflection, and Next Steps

Collichio F, Muchmore EA. Am Soc Clin Oncol Educ Book. 2018 May 23;(38):887-893. doi: 10.1200/EDBK_201773.

ABSTRACT:

The American Society of Hematology (ASH)/ASCO Curricular Milestones is a tool for assessment and teaching for fellows in hematology/oncology. The expectations of the Next Accreditation System of the Accreditation Council of Graduate Medical Education (ACGME) was developed over years from the creation of the six core competencies in 1999 to the current data-driven outcomes-based system. The current internal medicine subspecialty milestones (ACGME reporting milestones) follow the general rubric of the general internal medicine milestones. The ASH/ASCO curricular milestones were developed from the foundational elements of the specialty, and they are interwoven with the ACGME reporting milestones. The 2017 ACGME Milestones Report shows that the milestones display progression in performance through clear anchors. Educational outcomes are available in many specialties. The internal medicine subspecialties have been given the opportunity to update the ACGME reporting milestones. The ACGME has acknowledged that these milestones may be different for each of the specialties. The program committees of ASH and ASCO agree that revision of the ACGME reporting milestones would decrease the overlap of domains, lack of clarity, and negative language that is present in version 1.0. ASH and ASCO are working with the ACGME and American Board of Internal Medicine (ABIM) to develop Curricular Milestones, version 2.0.

Competency-Based Medical Education and the Ghost of Kuhn: Reflections on the Messy and Meaningful Work of Transformation.

Holmboe ES. Acad Med. 2018 Mar;93(3):350-353. doi: 10.1097/ACM.0000000000001866.

ABSTRACT:

The transition, if not transformation, to outcomes-based medical education likely represents a paradigm shift struggling to be realized. Paradigm shifts are messy and difficult but ultimately meaningful if done successfully. This struggle has engendered tension and disagreements, with many of these disagreements cast as either-or polarities. There is little disagreement, however, that the health care system is not effectively achieving the triple aim for all patients. Much of the tension and polarity revolve around how more effectively to prepare students and residents to work in and help change a complex health care system. Competencies were an initial attempt to facilitate this shift by creating frameworks of essential abilities needed by physicians. However, implementation of competencies has proven to be difficult. Entrustable professional activities (EPAs) in undergraduate and graduate medical education and Milestones in graduate medical education are recent concepts being tried and studied as approaches to guide the shift to outcomes. Their primary purpose is to help facilitate implementation of an outcomes-based approach by creating shared mental models of the competencies, which in turn can help to improve curricula and assessment. Understanding whether and how EPAs and Milestones effectively facilitate the shift to outcomes has been and will continue to be an iterative and ongoing reflective process across the entire medical education community using lessons from implementation and complexity science. In this Invited Commentary, the author reflects on what got the community to this point and some sources of tension involved in the struggle to move to outcomes-based education.

Using an Alumni Survey to Target Improvements in an Emergency Medicine Training Programme

Gaeta T, Mahalingam G, Pyle M, Dam A, Visconti A. Emerg Med J. 2018 Mar;35(3):189-191. doi: 10.1136/emmermed-2017-206692. Epub 2017 Oct 21.

INTRODUCTION:

The Accreditation Council for Graduate Medical Education (ACGME) is the governing body responsible for accrediting graduate medical training programme in the USA. The Emergency Medicine Milestones (EM-Milestones) were developed by the ACGME and American Board of Emergency Medicine as a guide and monitoring tool for the knowledge, skills, abilities and experiences to be acquired during training. Alumni surveys have been reported as a valuable resource for training programme to identify areas for improvement; however, there are few studies regarding programme improvement in emergency medicine. We aimed to use the EM- Milestones, adapted as an alumni self-assessment survey, to identify areas for training programme improvement.

METHODS:

This study was conducted at an urban, academic affiliated, community hospital in New York city with an emergency medicine training programme consisting of 30 residents over 3 years. Alumni of our emergency medicine training programme were sent an EM-Milestones-based self- assessment survey. Participants evaluated their ability in each EM-Milestones subcompetency on a Likert scale. Data were analysed using descriptive statistics.

RESULTS:

Response rate was 74% (69/93). Alumni reported achieving the target performance in 5/6 general competencies, with Systems-Based Practice falling below the target performance. The survey further identified 6/23 subcompetencies (Pharmacotherapy, Ultrasound, Wound Management, Patient Safety, Systems-Based Management and Technology) falling below the target performance level.

DISCUSSION:

Alumni self-evaluation of competence using the EM-Milestones provides valuable information concerning confidence to practice independently; these data, coupled with regular milestone evaluation of existing trainees, can identify problem areas and provide a blueprint for targeted programme improvement.

Are Surgical Milestone Assessments Predictive of In-Training Examination Scores?

Kimbrough MK, Thrush CR, Barrett E, Bentley FR, Sexton KW. J Surg Educ. 2018 Jan - Feb;75(1):29-32. doi: 10.1016/j.jsurg.2017.06.021. Epub 2017 Jul 5.

OBJECTIVES:

With the recent utilization of Accreditation Council for Graduate Medical Education developmental milestones as part of resident evaluation, we sought to explore whether milestone-based ratings were associated with American Board of Surgery In-Training Examination (ABSITE) scores.

METHODS:

Mid-year milestone ratings were obtained from the Accreditation Council for Graduate Medical Education Accreditation Database System for years 2014, 2015, and 2016 for all postgraduate years 1- 5 general surgery residents in our program and paired with ABSITE scores (n = 69) from January of the following year. Linear regression was used to assess predictor importance of milestones on both ABSITE percentage correct scores and ABSITE percentile scores.

RESULTS:

Minimal to small positive correlations were observed between milestones and ABSITE percentile scores ($r = 0.09-0.25$), while moderately large correlations were observed between milestones and percentage correct scores ($r = 0.65-0.76$). The Medical Knowledge 1 (MK1) milestone significantly predicted ABSITE percentage correct scores, and explained 60% of the variance (adjusted $R^2 = 0.603$). MK1 also significantly predicted ABSITE percentile scores, although weaker in magnitude, with MK1 explaining 20% of the variance (adjusted $R^2 = 0.197$). Postgraduate year level and other milestones were not influential predictors of ABSITE scores.

CONCLUSIONS:

The mid-year MK1 milestone rating was predictive of ABSITE scores and may serve as a useful marker for Clinical Competency Committees to identify residents who could benefit from additional support to prepare for the ABSITE, although given the small exploratory nature of this study, additional research is still needed.

Examination to Assess the Clinical Examination and Documentation of Spine Pathology among Orthopedic Residents

Haglin JM, Zeller JL, Egol KA, Phillips DP. Spine J. 2017 Dec;17(12):1830-1836. doi: 10.1016/j.spinee.2017.06.009. Epub 2017 Jun 13.

BACKGROUND:

The Accreditation Council for Graduate Medical Education (ACGME) guidelines requires residency programs to teach and evaluate residents in six overarching "core competencies" and document progress through educational milestones. To assess the progress of orthopedic interns' skills in performing a history, physical examination, and documentation of the encounter for a standardized patient with spinal stenosis, an objective structured clinical examination (OSCE) was conducted for 13 orthopedic intern residents, following a 1-month boot camp that included communications skills and curriculum in history and physical examination. Interns were objectively scored based on their performance of the physical examination, communication skills, completeness and accuracy of their electronic medical record (EMR), and their diagnostic conclusions gleaned from the patient encounter.

PURPOSE:

The purpose of this study was to meaningfully assess the clinical skills of orthopedic post-graduate year (PGY)-1 interns. The findings can be used to develop a standardized curriculum for documenting patient encounters and highlight common areas of weakness among orthopedic interns with regard to the spine history and physical examination and conducting complete and accurate clinical documentation.

STUDY SETTING:

A major orthopedic specialty hospital and academic medical center.

METHODS:

Thirteen PGY-1 orthopedic residents participated in the OSCE with the same standardized patient presenting with symptoms and radiographs consistent with spinal stenosis. Videos of the encounters were independently viewed and objectively evaluated by one investigator in the study. This evaluation focused on the completeness of the history and the performance and completion of the physical examination. The standardized patient evaluated the communication skills of each intern with a separate objective evaluation. Interns completed these same scoring guides to evaluate their own performance in history, physical examination, and communications skills. The interns' documentation in the EMR was then scored for completeness, internal consistency, and inaccuracies.

RESULTS:

The independent review revealed objective deficits in both the orthopedic interns' history and the physical examination, as well as highlighted trends of inaccurate and incomplete documentation in the corresponding medical record. Communication skills with the patient did not meet expectations. Further, interns tended to overscore themselves, especially with regard to their performance on the physical examination ($p < .0005$). Inconsistencies, omissions, and inaccuracies were common in the corresponding medical notes when compared with the events of the patient encounter. Nine of the 13 interns (69.2%) documented at least one finding that was not assessed or tested in the clinical encounter, and four of the 13 interns (30.8%) included inaccuracies in the medical record, which contradicted the information collected at the time of the encounter.

CONCLUSIONS:

The results of this study highlighted significant shortcomings in the completeness of the interns' spine history and physical examination, and the accuracy and completeness of their EMR note. The study provides a valuable exercise for evaluating residents in a multifaceted, multi-milestone manner that more accurately documents residents' clinical strengths and weaknesses. The study demonstrates that orthopedic residents require further instruction on the complexities of the spinal examination. It validates a need for increased systemic support for improving resident documentation through comprehensive education and evaluation modules.

Forensic Psychiatry Milestones: Experience after 1 Year

Stolar A, Candilis PJ, Frierson RL, Edgar L. Acad Psychiatry. 2017 Dec;41(6):789-792. doi: 10.1007/s40596-017-0739-8. Epub 2017 Jul 6.

OBJECTIVE:

In 1999, the Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Medical Specialties identified six core competencies for medical practice. In 2013, the milestones were introduced to demonstrate these educational outcomes across each specialty. This study represents the first examination of the sub-specialty Forensic Psychiatry Milestones.

METHODS:

Members of the Association of Directors of Forensic Psychiatry Fellowships were surveyed. Areas of inquiry included whether milestones assisted in identifying areas of deficiency in fellows or programs, whether the graduation milestones matched the goals of training, and what changes were planned, or had been made, based on their implementation.

RESULTS:

Twenty-six of 35 programs responded, for a response rate of 74%. The majority found the milestones somewhat or very useful, half found the graduation-level milestones matched the program's graduation goals, and a significant majority reported that the milestones assisted in identifying improvements, change, or intended change. In choosing terms to describe the milestones, however respondents chose a variety of negative or neutral terms, rather than positive ones.

CONCLUSIONS:

The milestones provided a standard mechanism for identifying areas for improvement and a common language to standardize practice. However, due to the variability across fellowship programs and the limitations of educational resources and time, implementation of the new ACGME requirement was characterized in largely negative terms. Recommendations for improvement included modification of the milestones themselves, flexibility in their implementation, and evidentiary support for their use.

Impact of an Event Reporting System on Resident Complication Reporting in Plastic Surgery Training: Addressing an ACGME and Plastic Surgery Milestone Project Core Competency

Parikh RP, Snyder-Warwick A, Naidoo S, Skolnick GB, Patel KB. *Plast Reconstr Surg.* 2017 Nov; 140(5):736e-745e. doi: 10.1097/PRS.0000000000003771.

BACKGROUND:

The Accreditation Council for Graduate Medical Education and Plastic Surgery Milestone Project has identified practice-based learning and improvement, which involves systematically analyzing current practices and implementing changes, as a core competency in residency education. In surgical care, complication reporting is an essential component of practice-based learning and improvement as complications are analyzed in morbidity and mortality conference for quality improvement. Unfortunately, current methods for capturing a comprehensive profile of complications may significantly underestimate the true occurrence of complications. Therefore, the objectives of this study are to evaluate an intervention for complication reporting and compare this to current practice, in a plastic surgery training program.

METHODS:

This is a pre-intervention and post-intervention study evaluating resident reporting of complications on a plastic surgery service. The intervention was an online event reporting system developed by department leadership and patient safety experts. The cohorts consisted of all patients undergoing surgery during two separate 3-month blocks bridged by an implementation period. A trained reviewer recorded complications, and this served as the reference standard. Fisher's exact test was used for binary comparisons.

RESULTS:

There were 32 complications detected in 219 patients from June to August of 2015 and 35 complications in 202 patients from October to December of 2015. The proportion of complications reported in the pre-intervention group was nine of 32 (28.1 percent). After the intervention, this significantly increased to 32 of 35 (91.4 percent) ($p < 0.001$).

CONCLUSION:

An intervention using an event reporting system, supported by departmental leadership, led to significant improvements in complication reporting by plastic surgery residents.

Program Director Perceptions of the General Surgery Milestones Project

Drolet BC, Marwaha JS, Wasey A, Pallant A. J Surg Educ. 2017 Mar 23. pii: S1931-7204(16)30373-7. doi: 10.1016/j.jsurg.2017.02.012.

OBJECTIVE:

As a result of the Milestones Project, all Accreditation Council for Graduate Medical Education accredited training programs now use an evaluation framework based on outcomes in 6 core competencies. Despite their widespread use, the Milestones have not been broadly evaluated. This study sought to examine program director (PD) perceptions of the Milestones Project.

DESIGN, SETTING, AND PARTICIPANTS:

A national survey of general surgery PDs distributed between January and March of 2016.

RESULTS:

A total of 132 surgical PDs responded to the survey (60% response rate). Positive perceptions included value for education (55%) and evaluation of resident performance (58%), as well as ability of Milestones to provide unbiased feedback (55%) and to identify areas of resident deficiency (58%). Meanwhile, time input and the ability of Milestones to discriminate underperforming programs were less likely to be rated positively (25% and 21%, respectively). Half of PDs felt that the Milestones were an improvement over their previous evaluation system (55%).

CONCLUSIONS:

Using the Milestones as competency-based, developmental outcomes measures, surgical PDs reported perceived benefits for education and objectivity in the evaluation of resident performance. The overall response to the Milestones was generally favorable, and most PDs would not return to their previous evaluation systems. To improve future iterations of the Milestones, many PDs expressed a desire for customization of the Milestones' content and structure to allow for programmatic differences.

Building a Framework of Entrustable Professional Activities, Supported by Competencies and Milestones, to Bridge the Educational Continuum

Carraccio C, Englander R, Gilhooly J, Mink R, Hofkosh D, Barone MA, Holmboe ES. *Acad Med.* 2017 Mar;92(3):324-330. doi: 10.1097/ACM.0000000000001141.

ABSTRACT:

The transition to competency-based medical education (CBME) and adoption of the foundational domains of competence by the Accreditation Council for Graduate Medical Education, Association of American Medical Colleges (AAMC), and American Board of Medical Specialties' certification and maintenance of certification (MOC) programs provided an unprecedented opportunity for the pediatrics community to create a model of learning and assessment across the continuum. Two frameworks for assessment in CBME have been promoted: (1) entrustable professional activities (EPAs) and (2) milestones that define a developmental trajectory for individual competencies. EPAs are observable and measurable units of work that can be mapped to competencies and milestones critical to performing them safely and effectively. The pediatrics community integrated the two frameworks to create a potential pathway of learning and assessment across the continuum from undergraduate medical education (UME) to graduate medical education (GME) and from GME to practice. The authors briefly describe the evolution of the Pediatrics Milestone Project and the process for identifying EPAs for the specialty and subspecialties of pediatrics. The method of integrating EPAs with competencies and milestones through a mapping process is discussed, and an example is provided. The authors illustrate the alignment of the AAMC's Core EPAs for Entering Residency with the general pediatrics EPAs and, in turn, the alignment of the latter with the subspecialty EPAs, thus helping build the bridge between UME and GME. The authors propose how assessment in GME, based on EPAs and milestones, can guide MOC to complete the bridge across the education continuum.

Initial Comparison of Resident and Attending Milestones Evaluations in Plastic Surgery.

Yao A, Massenburg BB, Silver L, Taub PJ. J Surg Educ. 2017 Mar 2. pii: S1931-7204(17)30068-5. doi: 10.1016/j.jsurg.2017.02.001.

BACKGROUND:

Graduate medical education has recently undergone a major archetypal shift toward competency-based evaluations of residents' performance. The implementation of the Milestones program by the Accreditation Council for Graduate Medical Education (ACGME) is a core component of the shift, designed to ensure uniformity in measuring residency knowledge using a series of specialty-specific achievements. This study evaluates the correlation between residents' self-evaluations and program directors' assessments of their performance.

METHODS:

The study population comprised 12 plastic surgery residents, ranging from postgraduate year 1 to postgraduate year 6, enrolled in an integrated residency program at a single institution.

RESULTS:

Overall, average attending scores were lower than average resident scores at all levels except postgraduate year 6. Correlation between resident and attending evaluations ranged from 0.417 to 0.957, with the correlation of average scores of Patient Care (0.854) and Medical Knowledge (0.816) Milestones significantly higher than those of professional skillsets (0.581). "Patient care, facial esthetics" was the Milestone with the lowest average scores from both groups. Residents scored themselves notably higher than their attendings' evaluations in Practice-based Learning and Improvement categories (+0.958) and notably lower in Medical Knowledge categories such as "Cosmetic Surgery, Trunk and Lower Extremities" (-0.375) and "Non-trauma hand" (-0.208). The total possible number of participants in this study was 12. The actual number of participants was 12 (100%).

CONCLUSIONS:

The remarkable range of correlations suggests that expectations for performance standards may vary widely between residents and program directors. Understanding gaps between expectations and performance is vital to inform current and future residents as the restructuring of the accreditation process continues.

New Roadmap for the Journey from Internist to Rheumatologist

Criscione-Schreiber LG, Brown CR, O'Rourke KS, et al. *Arthritis Care & Research*. 2017; 69(6):769-775. doi:10.1002/acr.23151.

OBJECTIVE:

Measurement is necessary to gauge improvement. US training programs have not previously used shared standards to assess trainees' mastery of the knowledge, skills, and attitudes necessary to practice rheumatology competently. In 2014, the Accreditation Council for Graduate Medical Education (ACGME) Next Accreditation System began requiring semiannual evaluation of all medicine subspecialty fellows on 23 internal medicine subspecialty reporting milestones. Since these reporting milestones are not subspecialty specific, rheumatology curricular milestones were needed to guide rheumatology fellowship training programs and fellows on the training journey from internist to rheumatologist.

METHODS:

Rheumatology curricular milestones were collaboratively composed by expanding the internal medicine reporting milestones to delineate the specific targets of rheumatology fellowship training within 6 ACGME core competencies. The 2006 American College of Rheumatology core curriculum for rheumatology training programs was updated.

RESULTS:

A total of 80 rheumatology curricular milestones were created, defining progressive learning through training; most focus on patient care and medical knowledge. The core curriculum update incorporates the new curricular milestones and rheumatology entrustable professional activities.

CONCLUSION:

Rheumatology curricular milestones are now available for implementation by rheumatology fellowship training programs, providing a clear roadmap for specific training goals and a guide to track each fellow's achievement over a 2-year training period. The comprehensive core curriculum delineates the essential breadth of knowledge, skills, and attitudes that define rheumatology, and provides a guide for educational activities during fellowship training. These guiding documents are now used to train and assess fellows as they prepare for independent rheumatology practice as the next generation of rheumatologists.

ASDS Cosmetic Dermatologic Surgery Fellowship Milestones

Waldman A, Arndt KA, Avram MM, Brown MR, Dover JS, Fabi SG, Friedmann DP, Geronemus RG, Goldberg DJ, Goldman MP, Green JB, Ibrahimi OA, Jones DH, Kilmer SL, McDaniel DH, Obagi S, Ortiz AE, Rohrer TE, Taylor MB, Torres A, Weinkle SH, Weiss MA, Weiss ET, Weiss RA, Poon E, Alam M. *Dermatol Surg.* 2016 Oct;42(10):1164-73. doi: 10.1097/DSS.0000000000000860.

BACKGROUND:

The American Council of Graduate Medical Education, which oversees much of postgraduate medical education in the United States, has championed the concept of "milestones," standard levels of achievement keyed to particular time points, to assess trainee performance during residency.

OBJECTIVE:

To develop a milestones document for the American Society for Dermatologic Surgery (ASDS) Cosmetic Dermatologic Surgery (CDS) fellowship program.

METHODS:

An ad hoc milestone drafting committee was convened that included members of the ASDS Accreditation Work Group and program directors of ASDS-approved Cosmetic Dermatologic Surgery (CDC) fellowship training programs. Draft milestones were circulated through email in multiple rounds until consensus was achieved.

RESULTS:

Thirteen milestones were developed in the 6 Accreditation Council for Graduate Medical Education (ACGME) competency areas, with 8 of these being patient-care milestones. Additional instructions for milestone administration more specific to the CDS fellowship than general ACGME instructions were also approved. Implementation of semiannual milestones was scheduled for the fellowship class entering in July 2018.

CONCLUSION:

Milestones are now available for CDS fellowship directors to implement in combination with other tools for fellow evaluation.

The Road Ahead in Education: Milestones for Geriatric Psychiatry Subspecialty Training

Swantek SS, Maixner SM, Llorente MD, Cheong JA, Edgar L, Thomas CR, Ahmed I. Am J Geriatr Psychiatry. 2016 Sep;24(9):675-89. doi: 10.1016/j.jagp.2016.03.011. Epub 2016 Apr 6.

OBJECTIVE:

The Accreditation Council of Graduate Medical Education (ACGME) Milestone Project is the next step in a series of changes revamping the system of graduate medical education. In 2013 the ACGME completed the general psychiatry milestones. The ACGME then pursued creation of milestones for accredited psychiatric subspecialty fellowships. This article documents the work of the geriatric psychiatry subspecialty milestones work group. It reports the history and rationale supporting the milestones, the milestone development process, and the implications for geriatric psychiatry fellowship training.

METHODS:

In consultation with the American Association for Geriatric Psychiatry, the American Board of Psychiatry and Neurology, and the ACGME Psychiatry Residency Review Committee, the ACGME appointed a working group to create the geriatric psychiatry milestones using the general psychiatry milestones as a guide.

CONCLUSION:

The geriatric psychiatry milestones are the result of an iterative process resulting in the definition of the characteristics vital to a fellowship-trained geriatric psychiatrist. It is premature to assess their effect on psychiatric training. The true impact of the milestones will be determined as each training director uses the milestones to re-evaluate their program curriculum and the educational and clinical learning environment. The ACGME is currently collecting the information about the milestone performance of residents and fellows to further refine and determine how the milestones can best be used to assist programs in improving training.

Defining, Achieving, and Maintaining Competence in Cardiovascular Training and Practice

Kuvin JT, Williams ES. J Am Coll Cardiol. 2016 Sep 20;68(12):1342-7. doi: 10.1016/j.jacc.2016.05.097.

ABSTRACT:

Patients, hospitals, insurers, and the public rely on competent physicians. The definition and documentation of competency in cardiovascular training and practice continues to evolve. New tools, such as the American College of Cardiology's in-training examination, restructured Core Cardiovascular Training Statement, curricular and lifelong learning competencies, and the Accreditation Council for Graduate Medical Education Milestones help define competent trainees and practitioners, and level the playing field. The American Board of Internal Medicine's Maintenance of Certification program is undergoing critical review, and a common vision of its future form and role are not yet clear. This paper explores present-day cardiovascular competency components, assessment tools, and strategies, and identifies challenges for the future.

What Is a Rheumatologist and How Do We Make One?

Brown CR Jr, Criscione-Schreiber L, O'Rourke KS, Fuchs HA, Putterman C, Tan IJ, Valeriano- Marcet J, Hsieh E, Zirkle S, Bolster MB. *Arthritis Care Res (Hoboken)*. 2016 Aug;68(8):1166-72. doi: 10.1002/acr.22817.

OBJECTIVE:

Graduate medical education is a critical time in the training of a rheumatologist, and purposeful evaluation of abilities during this time is essential for long-term success as an independent practitioner. The internal medicine subspecialties collectively developed a uniform set of reporting milestones by which trainees can be assessed and receive formative feedback, providing clarity of accomplishment as well as areas for improvement in training. Furthermore, the reporting milestones provide a schema for assessment and evaluation of fellows by supervisors. The internal medicine subspecialties were also tasked with considering entrustable professional activities (EPAs), which define the abilities of a subspecialty physician who has attained sufficient mastery of the field to be accountable to stakeholders and participate in independent practice. Although EPAs have been established for a few specialties, they had not yet been described for rheumatology. EPAs have value as descriptors of the comprehensive abilities, knowledge, and skills of a practicing rheumatologist. The rheumatology EPAs have a role in defining a specialist in rheumatology upon completion of training, and also represent the ways our specialty defines our abilities that are enduring throughout practice.

METHODS:

We describe the collaborative process of the development of both the subspecialty reporting milestones and the rheumatology EPAs. The reporting milestones evolved through discussions and collaborations among representatives from the Association of Specialty Professors, the Alliance for Academic Internal Medicine, the American Board of Internal Medicine, and the Accreditation Council for Graduate Medical Education. The EPAs were a product of deliberations by the Next Accreditation System (NAS) working group of the American College of Rheumatology (ACR) Committee on Rheumatology Training and Workforce Issues.

RESULTS:

Twenty-three subspecialty reporting milestones and 14 rheumatology EPAs were advanced and refined over the course of 3 subspecialty reporting milestone development summits and 3 ACR NAS working group meetings, respectively.

CONCLUSION:

The subspecialty reporting milestones and rheumatology EPAs presented here stipulate reasonable and measurable expectations for rheumatologists-in-training. Together, these tools aim to promote enrichment and greater accountability in the training of fellows. Additionally, the EPAs define, for all stakeholders, the expertise of a rheumatologist in practice.

"What Program Directors Think" III: Results of the 2014/2015 Annual Surveys of the Association of Program Directors in Radiology (APDR)

Rozenshtein A, Heitkamp DE, Muhammed TL, Sclamberg JS, Paladin AM, Smith SE, Nguyen JB, Robbin M. Acad Radiol. 2016 Jul;23(7):861-9. doi: 10.1016/j.acra.2016.03.005. Epub 2016 Jun 8.

RATIONALE AND OBJECTIVES:

The Association of Program Directors in Radiology regularly surveys its members regarding issues of importance to support radiology residency programs and their directors.

MATERIALS AND METHODS:

This is an observational cross-sectional study using two Web-based surveys posed to the Association of Program Directors in Radiology membership in the fall of 2014 (49 items) and the spring of 2015 (46 items) on the subjects of importance to the members, including the Accreditation Council on Graduate Medical Education Milestones, the Non-Interpretative Skills Curriculum, the American Board of Radiology Core Examination, the effect of the new resident testing and program accreditation paradigms on training outcomes, the 2015 Residency Match, the Interventional Radiology/Diagnostic Radiology (IR/DR) Residency, and Program Director (PD)/Program Coordinator resources.

RESULTS:

Responses were collected electronically, results were tallied using Survey Monkey software, and qualitative responses were tabulated or summarized as comments. Findings were reported during the 63rd annual meeting of the Association of University Radiologists. The maximal response rate was 33% in the fall of 2014 and 36% in the spring of 2015.

CONCLUSIONS:

PDs believed that the radiology Milestones, now largely implemented, did not affect overall resident evaluation, was not reflective of resident experience, and actually made evaluation of residents more difficult. PDs also felt that although the American Board of Radiology oral examination had been a better test for clinical practice preparedness, their new residents knew at least as much as before. There was little evidence of recall reemergence. The radiology training community saw a drop in residency applicant quality as demonstrated by the United States Medical Licensing Examination scores and clinical rotation grades. Because the new IR/DR Residency positions were to be funded at the expense of the traditional DR positions, the majority of PDs expected a negative effect of the impending IR/DR match on their DR recruitment. PDs were in favor of a unified clinical radiology curriculum similar to the Radiological Society of North America online physics modules.

Teaching the Healthcare Economics Milestones to Radiology Residents: Our Pilot Curriculum Experience

Prober AS, Mehan WA Jr, Bedi HS. Acad Radiol. 2016 Jul;23(7):885-8. doi: 10.1016/j.acra. 2016.02.014. Epub 2016 Apr 1.

RATIONALE AND OBJECTIVES:

Since July 2013, the Accreditation Council for Graduate Medical Education (ACGME) has required radiology residency programs to implement a set of educational milestones to track residents' educational advancement in six core competencies, including Systems-based Practice. The healthcare economics subcompetency of Systems-based Practice has traditionally been relatively neglected, and given the new increased ACGME oversight, will specifically require greater focused attention.

MATERIALS AND METHODS:

A multi-institutional health-care economics pilot curriculum combining didactic and practical components was implemented across five residency programs. The didactic portion included a package of online recorded presentations, reading, and testing materials developed by the American College of Radiology (ACR's) Radiology Leadership Institute. The practical component involved a series of local meetings led by program faculty with the production of a deliverable based on research of local reimbursement for a noncontrast head computed tomography. The capstone entailed the presentation of each program's deliverable during a live teleconference webcast with a Radiology Leadership Institute content expert acting as moderator and discussion leader.

RESULTS:

The pilot curriculum was well received by residents and faculty moderators, with 100% of survey respondents agreeing that the pilot met its objective of introducing how reimbursement works in American radiology in 2015 and how business terminology applies to their particular institutions.

CONCLUSION:

A health-care economics curriculum in the style of a Massive Open Online Course has strong potential to serve as many residency programs' method of choice in meeting the health-care economics milestones.

Pathology Informatics Essentials for Residents: A Flexible Informatics Curriculum Linked to Accreditation Council for Graduate Medical Education Milestones (a secondary publication).

Henricks WH, Karcher DS, Harrison JH Jr, Sinard JH, Riben MW, Boyer PJ, Plath S, Thompson A, Pantanowitz L. Acad Pathol. 2016 Jul 11;3:2374289516659051. doi: 10.1177/2374289516659051. eCollection 2016 Jan-Dec.

BACKGROUND:

Recognition of the importance of informatics to the practice of pathology has surged. Training residents in pathology informatics has been a daunting task for most residency programs in the United States because faculty often lacks experience and training resources. Nevertheless, developing resident competence in informatics is essential for the future of pathology as a specialty.

OBJECTIVE:

To develop and deliver a pathology informatics curriculum and instructional framework that guides pathology residency programs in training residents in critical pathology informatics knowledge and skills, and meets Accreditation Council for Graduate Medical Education Informatics Milestones.

DESIGN:

The College of American Pathologists, Association of Pathology Chairs, and Association for Pathology Informatics formed a partnership and expert work group to identify critical pathology informatics training outcomes and to create a highly adaptable curriculum and instructional approach, supported by a multiyear change management strategy.

RESULTS:

Pathology Informatics Essentials for Residents (PIER) is a rigorous approach for educating all pathology residents in important pathology informatics knowledge and skills. PIER includes an instructional resource guide and toolkit for incorporating informatics training into residency programs that vary in needs, size, settings, and resources. PIER is available at <http://www.apcprods.org/PIER> (accessed April 6, 2016).

CONCLUSIONS:

PIER is an important contribution to informatics training in pathology residency programs. PIER introduces pathology trainees to broadly useful informatics concepts and tools that are relevant to practice. PIER provides residency program directors with a means to implement a standardized informatics training curriculum, to adapt the approach to local program needs, and to evaluate resident performance and progress over time.

The Problem Resident Behavior Guide: Strategies for Remediation

Williamson K, Quattromani E, Aldeen A. Intern Emerg Med. 2016 Apr;11(3):437-49. doi: 10.1007/s11739-015-1367-5. Epub 2015 Dec 14.

ABSTRACT:

In 2012, the ACGME supplemented the core competencies with outcomes-based milestones for resident performance within the six competency domains. These milestones address the knowledge, skills, abilities, attitudes, and experiences that a resident is expected to progress through during the course of training. Even prior to the initiation of the milestones, there was a paucity of EM literature addressing the remediation of problem resident behaviors and there remain few readily accessible tools to aid in the implementation of a remediation plan. The goal of the "Problem Resident Behavior Guide" is to provide specific strategies for resident remediation based on deficiencies identified within the framework of the EM milestones. The "Problem Resident Behavior Guide" is a written instructional manual that provides concrete examples of remediation strategies to address specific milestone deficiencies. The more than 200 strategies stem from the experiences of the authors who have professional experience at three different academic hospitals and emergency medicine residency programs, supplemented by recommendations from educational leaders as well as utilization of valuable education adjuncts, such as focused simulation exercises, lecture preparation, and themed ED shifts. Most recommendations require active participation by the resident with guidance by faculty to achieve the remediation expectations. The ACGME outcomes-based milestones aid in the identification of deficiencies with regards to resident performance without providing recommendations on remediation. The Problem Resident Behavior Guide can therefore have a significant impact by filling in this gap.

Implementation of Competency-Based Medical Education: Are We Addressing the Concerns and Challenges?

Hawkins RE, Welcher CM, Holmboe ES, Kirk LM, Norcini JJ, Simons KB, Skochelak SE. Med Educ. 2015 Nov;49(11):1086-102. doi: 10.1111/medu.12831.

CONTEXT:

Competency-based medical education (CBME) has emerged as a core strategy to educate and assess the next generation of physicians. Advantages of CBME include: a focus on outcomes and learner achievement; requirements for multifaceted assessment that embraces formative and summative approaches; support of a flexible, time-independent trajectory through the curriculum; and increased accountability to stakeholders with a shared set of expectations and a common language for education, assessment and regulation.

OBJECTIVES:

Despite the advantages of CBME, numerous concerns and challenges to the implementation of CBME frameworks have been described, including: increased administrative requirements; the need for faculty development; the lack of models for flexible curricula, and inconsistencies in terms and definitions. Additionally, there are concerns about reductionist approaches to assessment in CBME, lack of good assessments for some competencies, and whether CBME frameworks include domains of current importance. This study will outline these issues and discuss the responses of the medical education community.

METHODS:

The concerns and challenges expressed are primarily categorised as: (i) those related to practical, administrative and logistical challenges in implementing CBME frameworks, and (ii) those with more conceptual or theoretical bases. The responses of the education community to these issues are then summarised.

CONCLUSIONS:

The education community has begun to address the challenges involved in implementing CBME. Models and guidance exist to inform implementation strategies across the continuum of education, and focus on the more efficient use of resources and technology, and the use of milestones and entrustable professional activities-based frameworks. Inconsistencies in CBME definitions and frameworks remain a significant obstacle. Evolution in assessment approaches from in vitro task-based methods to in vivo integrated approaches is responsive to many of the theoretical and conceptual concerns about CBME, but much work remains to be done to bring rigour and quality to work-based assessment.

Interprofessional Collaboration Milestones: Advocating for Common Assessment Criteria in Graduate Medical Education

Wingo MT, Havyer RD, Comfere NI, Nelson DR, Reed DA. BMC Med Educ. 2015 Sep 14;15:149. doi: 10.1186/s12909-015-0432-0.

BACKGROUND:

Milestone-based assessments of resident physicians inform critical decisions regarding resident competence and advancement. Thus, it is essential that milestone evaluations are based upon strong validity evidence and that consistent evaluation criteria are used across residency programs. A common approach to assessment of interprofessional collaboration milestones is particularly important since standardized measures of individual resident competence in interprofessional collaboration have not been established.

DISCUSSION:

We propose that assessments of interprofessional collaboration in graduate medical education meet common criteria, namely, these assessments should: 1) measure competency of an individual resident, 2) occur in the context of an interprofessional team, 3) be ascertained via direct observation of the resident, 4) be performed in a real-world clinical practice setting (such as a hospital ward, outpatient clinic, or operating room). We present the evidence-based rationale for these criteria and cite examples of published assessment instruments that fulfill one or more of the criteria, however further research is needed to ensure fidelity of assessments. The proposed criteria may assist residency educators as they endeavor to provide robust and consistent assessments of interprofessional collaboration milestones.

Achieving the Desired Transformation: Thoughts on Next Steps for Outcomes-Based Medical Education

Holmboe ES, Batalden P. Acad Med. 2015 Sep;90(9):1215-23. doi:10.1097/ACM.0000000000000779.

ABSTRACT:

Since the introduction of the outcomes-based medical education (OBME) movement, progress toward implementation has been active but challenging. Much of the angst and criticism has been directed at the approaches to assessment that are associated with outcomes-based or competency frameworks, particularly defining the outcomes. In addition, these changes to graduate medical education (GME) are concomitant with major change in health care systems—specifically, changes to increase quality and safety while reducing cost. Every sector, from medical education to health care delivery and financing, is in the midst of substantial change and disruption. The recent release of the Institute of Medicine's report on the financing and governance of GME highlights the urgent need to accelerate the transformation of medical education. One source of continued tension within the medical education community arises from the assumption that the much-needed increases in value and improvement in health care can be achieved by holding the current educational structures and architecture of learning in place while concomitantly withdrawing resources. The authors of this Perspective seek to reframe the important and necessary debate surrounding the current challenges to implementing OBME. Building on recent change and service theories (e.g., Theory U and coproduction), they propose several areas of redirection, including reexamination of curricular models and greater involvement of learners, teachers, and regulators in cocreating new training models, to help facilitate the desired transformation in medical education.

Reflections on the First 2 Years of Milestone Implementation

Holmboe ES, Yamazaki K, Edgar L, Conforti L, Yaghmour N, Miller RS, Hamstra SJ. J Grad Med Educ. 2015;7(3):506-11. doi: 10.4300/JGME-07-03-43.

-No Abstract Available.

Developing a Comprehensive Resident Education Evaluation System in the Era of Milestone Assessment

Gardner AK, Scott DJ, Choti MA, Mansour JC. J Surg Educ. 2015 Jul-Aug;72(4):618-24. doi: 10.1016/j.jsurg.2014.12.007. Epub 2015 Jan 23.

OBJECTIVES:

In an effort to move training programs toward competency-based education, the Accreditation Council for Graduate Medical Education (ACGME) introduced the Next Accreditation System (NAS), which organizes specific milestones regarding resident skills, knowledge, and abilities along a continuum. In order to foster innovation and creativity, the ACGME has provided programs with minimal guidelines regarding the optimal way to approach these milestones.

METHODS:

The education team at UT Southwestern embraced the milestones and developed a process in which performance assessment methods were critically evaluated, mapped onto an extrapolated performance list corresponding to the areas required by the ACGME milestones, and filled gaps in the previous system by modifying evaluation tools and creating new program components.

RESULTS:

Although the authors are early in the evolution of applying the new milestones system, this approach has thus far allowed them to comprehensively evaluate the residents and the program in an efficient and effective fashion, with notable improvements compared to the prior approach.

CONCLUSIONS:

The authors hope that these experiences can inform others embarking upon similar journeys with the milestones.

The New Accreditation Council for Graduate Medical Education Next Accreditation System Milestones Evaluation System: What Is Expected and How Are Plastic Surgery Residency Programs Preparing?

Sillah NM, Ibrahim AM, Lau FH, Shah J, Medin C, Lee BT, Lin SJ. *Plast Reconstr Surg.* 2015 Jul;136(1): 181-7. doi: 10.1097/PRS.0000000000001368.

BACKGROUND:

The Accreditation Council for Graduate Medical Education Next Accreditation System milestones were implemented for plastic surgery programs in July of 2014. Forward progress through the milestones is an indicator of trainee-appropriate development, whereas regression or stalling may indicate the need for concentrated, targeted training.

METHODS:

Online software at www.surveymonkey.com was used to create a survey about the program's approaches to milestones and was distributed to program directors and administrators of 96 Accreditation Council for Graduate Medical Education-approved plastic surgery programs.

RESULTS:

The authors had a 63.5 percent response rate (61 of 96 plastic surgery programs). Most programs report some level of readiness, only 22 percent feel completely prepared for the Next Accreditation System milestones, and only 23 percent are completely satisfied with their planned approach for compliance. Seventy-five percent of programs claim to be using some form of electronic tracking system. Programs plan to use multiple tools to capture and report milestone data. Most programs (44.4 percent) plan to administer evaluations at the end of each rotation. Over 70 percent of respondents believe that the milestones approach would improve the quality of resident training. However, programs were less than confident that their current compliance systems would live up to their full potential.

CONCLUSIONS:

The Next Accreditation System has been implemented nationwide for plastic surgery training programs. Milestone-based resident training is a new paradigm for residency training evaluation; programs are in the process of making this transition to find ways to make milestone data meaningful for faculty and residents.

Implementation of Nephrology Subspecialty Curricular Milestones

Yuan CM, Prince LK, Oliver JD 3rd, Abbott KC, Nee R. Am J Kidney Dis. 2015 Jul;66(1):15-22. doi: 10.1053/j.ajkd.2015.01.020. Epub 2015 Mar 12.

ABSTRACT:

Beginning in the 2014-2015 training year, the US Accreditation Council for Graduate Medical Education (ACGME) required that nephrology Clinical Competency Committees assess fellows' progress toward 23 subcompetency "context nonspecific" internal medicine subspecialty milestones. Fellows' advancement toward the "ready for unsupervised practice" target milestone now is tracked in each of the 6 competencies: Patient Care, Medical Knowledge, Professionalism, Interpersonal Communication Skills, Practice-Based Learning and Improvement, and Systems-Based Practice. Nephrology program directors and subspecialty societies must define nephrology-specific "curricular milestones," mapped to the nonspecific ACGME milestones. Although the ACGME goal is to produce data that can discriminate between successful and underperforming training programs, the approach is at risk to produce biased, inaccurate, and unhelpful information. We map the ACGME internal medicine subspecialty milestones to our previously published nephrology-specific milestone schema and describe entrustable professional activities and other objective assessment tools that inform milestone decisions. Mapping our schema onto the ACGME subspecialty milestone reporting form allows comparison with the ACGME subspecialty milestones and the curricular milestones developed by the American Society of Nephrology Program Directors. Clinical Competency Committees may easily adapt and directly translate milestone decisions reached using our schema onto the ACGME internal medicine subspecialty competency milestone-reporting format.

Initial Validity Analysis of the Emergency Medicine Milestones

Beeson MS, Holmboe ES, Korte RC, Nasca TJ, Brigham T, Russ CM, Whitley CT, Reisdorff EJ. Acad Emerg Med. 2015 Jul;22(7):838-44. doi: 10.1111/acem.12697. Epub 2015 Jun 25.

OBJECTIVES:

The Accreditation Council for Graduate Medical Education (ACGME) Milestones describe behavioral markers for the progressive acquisition of competencies during residency. As a key component of the Next Accreditation System, all residents are evaluated for the acquisition of specialty-specific Milestones. The objective was to determine the validity and reliability of the emergency medicine (EM) Milestones.

METHODS:

The ACGME and the American Board of Emergency Medicine performed this single-event observational study. The data included the initial EM Milestones performance ratings of all categorical EM residents submitted to the ACGME from October 31, 2013, to January 6, 2014. Mean performance ratings were determined for all 23 subcompetencies for every year of residency training. The internal consistency (reliability) of the Milestones was determined using a standardized Cronbach's alpha coefficient. Exploratory factor analysis was conducted to determine how the subcompetencies were interrelated.

RESULTS:

EM Milestone performance ratings were obtained on 100% of EM residents (n = 5,805) from 162 residency programs. The mean performance ratings of the aggregate and individual subcompetency scores showed discrimination between residency years, and the factor structure further supported the validity of the EM Milestones. The reliability was $\alpha = 0.96$ within each year of training.

CONCLUSIONS:

The EM Milestones demonstrated validity and reliability as an assessment instrument for competency acquisition. EM residents can be assured that this evaluation process has demonstrated validity and reliability; faculty can be confident that the Milestones are psychometrically sound; and stakeholders can know that the Milestones are a nationally standardized, objective measure of specialty-specific competency acquisition.

Internal Medicine Residents' Perspectives on Receiving Feedback in Milestone Format

Angus S, Moriarty J, Nardino RJ, Chmielewski A, Rosenblum MJ. J Grad Med Educ. 2015 Jun;7(2):220-4. doi: 10.4300/JGME-D-14-00446.1.

BACKGROUND:

In contrast to historical feedback, which was vague or provided residents' numerical scores without clear meaning, milestone-based feedback is focused on specific knowledge, skills, and behaviors that define developmental trajectory. It was anticipated that residents would welcome the more specific and actionable feedback provided by the milestone framework, but this has not been studied.

OBJECTIVE:

We assessed internal medicine (IM) residents' perceptions of receiving feedback in the milestone framework, particularly assessing perception of the utility of milestone-based feedback compared to non-milestone-based feedback.

METHODS:

We surveyed a total of 510 IM residents from 7 institutions. Survey questions assessed resident perception of milestone feedback in identifying strengths, weaknesses, and trajectory of professional development. Postgraduate years 2 and 3 (PGY-2 and PGY-3) residents were asked to compare milestones with prior methods of feedback.

RESULTS:

Of 510 residents, 356 (69.8%) responded. Slightly less than half of the residents found milestone-based feedback "extremely useful" or "very useful" in identifying strengths (44%), weaknesses (43%), specific areas for improvement (45%), and appropriate education progress (48%). Few residents found such feedback "not very useful" or "not at all useful" in these domains. A total of 51% of PGY-2 and PGY-3 residents agreed that receiving milestone-based feedback was more helpful than previous forms of feedback.

CONCLUSIONS:

IM residents are aware of the concepts of milestones, and half of the residents surveyed found milestone feedback more helpful than previous forms of feedback. More work needs to be done to understand how milestone-based feedback could be delivered more effectively to enhance resident development.

Realizing the Promise of Competency-Based Medical Education

Holmboe ES. Acad Med. 2015 Apr;90(4):411-3. doi: 10.1097/ACM.0000000000000515.

ABSTRACT

Competency-based medical education (CBME) places a premium on both educational and clinical outcomes. The Milestones component of the Next Accreditation System represents a fundamental change in medical education in the United States and is part of the drive to realize the full promise of CBME. The Milestones framework provides a descriptive blueprint in each specialty to guide curriculum development and assessment practices. From the beginning of the Outcomes project in 1999, the Accreditation Council for Graduate Medical Education and the larger medical education community recognized the importance of improving their approach to assessment. Work-based assessments, which rely heavily on the observations and judgments of clinical faculty, are central to a competency-based approach. The direct observation of learners and the provision of robust feedback have always been recognized as critical components of medical education, but CBME systems further elevate their importance. Without effective and frequent direct observation, coaching, and feedback, the full potential of CBME and the Milestones cannot be achieved.

Furthermore, simply using the Milestones as end-of-rotation evaluations to "check the box" to meet requirements undermines the intent of an outcomes-based accreditation system. In this Commentary, the author explores these challenges, addressing the concerns raised by Williams and colleagues in their Commentary. Meeting the assessment challenges of the Milestones will require a renewed commitment from institutions to meet the profession's "special obligations" to patients and learners. All stakeholders in graduate medical education must commit to a professional system of self-regulation to prepare highly competent physicians to fulfill this social contract.

The New Milestones: Do We Need to Take a Step Back to Go a Mile Forward?

Dewan M, Manring J, Satish U. Acad Psychiatry. 2015 Apr;39(2):147-50. doi: 10.1007/s40596-014-0213-9. Epub 2014 Aug 9.

ABSTRACT:

The Milestones Project, like all previous systems and changes in graduate psychiatric education, for example, moving from 3 to 4 years of training or adopting six competency domains, has been devised without any supporting data and does not assess meaningful outcomes, such as improved patient outcomes. No evidence is presented that Milestones-based training will produce better psychiatrists. There is a path forward. First, replace unproven expert consensus with scientific and evidence-based approaches. Second, exchange endpoints that are easy to assess but uncorrelated with real world functioning (e.g., multiple-choice examinations) for outcomes that are meaningful and external to the training program (e.g., patient outcomes). Finally, to prevent possible waste, excess burden, or harm, no changes should be mandated until proven in prospective studies.

The Milestones for Psychosomatic Medicine Subspecialty Training

Boland RJ, Becker M, Levenson JL, Servis M, Crone CC, Edgar L, Thomas CR. Psychosomatics. 2015 Mar-Apr;56(2):153-67. doi: 10.1016/j.psych.2014.11.003. Epub 2014 Nov 13.

BACKGROUND:

The Accreditation Council of Graduate Medical Education Milestones project is a key element in the Next Accreditation System for graduate medical education. On completing the general psychiatry milestones in 2013, the Accreditation Council of Graduate Medical Education began the process of creating milestones for the accredited psychiatric subspecialties.

METHODS:

With consultation from the Academy of Psychosomatic Medicine, the Accreditation Council of Graduate Medical Education appointed a working group to create the psychosomatic medicine milestones, using the general psychiatry milestones as a starting point.

RESULTS:

This article represents a record of the work of this committee. It describes the history and rationale behind the milestones, the development process used by the working group, and the implications of these milestones on psychosomatic medicine fellowship training.

CONCLUSIONS:

The milestones, as presented in this article, will have an important influence on psychosomatic medicine training programs. The implications of these include changes in how fellowship programs will be reviewed and accredited by the Accreditation Council of Graduate Medical Education and changes in the process of assessment and feedback for fellows.

Two Cheers for Milestones

Pangaro LN. J Grad Med Educ. 2015 Mar;7(1):4-6. doi: 10.4300/JGME-D-14-00738.1.

This editorial will explore the implementation of milestones across graduate medical education (GME) from 2 perspectives. The first is my perspective as a clinician, who often asks, “How do I make decisions with a patient when there isn't evidence to use as a guideline?” The second is my perspective as a department chair who asks a different question: “What resources are needed for milestone implementation?”

2015 APDS SPRING MEETING: Milestones: The Road to Faculty Development

Shah D, Goettler CE, Torrent DJ, et al. *Journal of Surgical Education*. 2015;72:e226-e235. doi:10.1016/j.jsurg.2015.06.017.

PURPOSE:

Milestones for the assessment of residents in graduate medical education mark a change in our evaluation paradigms. The Accreditation Council for Graduate Medical Education has created milestones and defined them as significant points in development of a resident based on the 6 competencies. We propose that a similar approach be taken for resident assessment of teaching faculty. We believe this will establish parity and objectivity for faculty evaluation, provide improved data about attending surgeons' teaching, and standardize faculty evaluations by residents.

METHODS:

A small group of advanced surgery educators determined appropriate educational characteristics, resulting in creation of 11 milestones (Fig. 2) that were reviewed by faculty and residents. The residents have historically answered 16 questions, developed by our surgical education committee (Fig. 3), on a 5-point Likert score (never to very often). Three weeks after completing this Likert-type evaluation, the residents were asked to again evaluate attending faculty using the Faculty Milestones evaluation. The residents then completed a survey of 7 questions (scale of 1-9—disagree to strongly agree, neutral = 5), assessing the new milestones and compared with the previous Likert evaluation system.

RESULTS:

Of 32 surgery residents, 13 completed the Likert evaluations (3760 data points) and 13 completed the milestones evaluations (1800 data points). The number completing both or neither is not known, as the responses are anonymous when used for faculty feedback. The Faculty Milestones attending physicians' scores have far fewer top of range scores (21% vs 42%) and have a wider spread of data giving better indication of areas for improvement in teaching skills. The residents completed 17 surveys (116 responses) to evaluate the new milestones system. Surveys indicated that milestones were easier to use (average rating 6.13 ± 0.42 Standard Error (SE)), effective (6.82 ± 0.39) and efficient (6.11 ± 0.53), and more objective ($6.69 \pm 0.39/6.75 \pm 0.38$) than the Likert evaluations are. Average response was 6.47 ± 0.46 for overall satisfaction with the Faculty Milestones evaluation. More surveys were completed than evaluations, as all residents had an opportunity to review both evaluation systems.

CONCLUSIONS:

Faculty Milestones are more objective in evaluating surgical faculty and mirror the new paradigm in resident evaluations. Residents found this was an easier, more effective, efficient, and objective evaluation of our faculty. Although our Faculty Milestones are designed for surgical educators, they are likely to be applicable with appropriate modifications to other medical educators as well.

Cytopathology Fellowship Milestones

Naritoku WY, Black-Schaffer WS. Cancer Cytopathol. 2014 Dec;122(12):859-65. doi: 10.1002/cncy.21483. Epub 2014 Sep 18.

ABSTRACT:

The American Society of Cytopathology has provided guidelines for goals and objectives for cytopathology fellows. There are 90 Accreditation Council for Graduate Medical Education- accredited cytopathology fellowship training programs in the United States, each with its own unique curriculum designed to achieve these goals and objectives. The Accreditation Council for Graduate Medical Education cytopathology fellowship milestones were developed to ensure some uniformity in the outcomes of the various skill sets and competencies expected of a graduating cytopathology fellow. The rationale, development, and details of the cytopathology fellowship milestones are described herein.

Medical Specialty Boards Can Help Measure Graduate Medical Education Outcomes

Peterson LE, Carek P, Holmboe ES, Puffer JC, Warm EJ, Phillips RL. Acad Med. 2014 Jun;89(6):840-2. doi: 10.1097/ACM.0000000000000250.

ABSTRACT:

U.S. graduate medical education (GME) training institutions are under increasing scrutiny to measure program outcomes as a demonstration of accountability for the sizeable funding they receive from the federal government. The Accreditation Council for Graduate Medical Education (ACGME) is a potential agent of measuring GME accountability but has no interaction with physicians after residency training is completed. American Board of Medical Specialty (ABMS) member boards interact with physicians throughout their careers through maintenance of certification (MOC) and are a potential source of valuable data on physician competency and quality of care, both of which could be used to measure GME accountability. The authors propose that ABMS boards and the ACGME deepen their existing relationship to better assess residency training outcomes. ABMS boards have a wealth of data on physicians collected as a by-product of MOC and business operations. Further, many ABMS boards collect practice demographics and scope-of-practice information through MOC enrollment surveys or recertification examination questionnaires. These data are potentially valuable in helping residencies know what their graduates are doing in practice. Part 4 of MOC generally involves assessment of the quality of care delivered in practice, and ABMS boards could share these deidentified data with the ACGME and residency programs to provide direct feedback on the practice outcomes of graduates. ABMS member boards and the ACGME should broaden their long-standing relationship to further develop shared roles and data-sharing mechanisms to better inform residencies and the public about GME training outcomes.

Putting the Pediatrics Milestones into Practice: A Consensus Roadmap and Resource Analysis

Schumacher DJ, Spector ND, Calaman S, West DC, Cruz M, Frohna JG, Gonzalez Del Rey J, Gustafson KK, Poynter SE, Rosenbluth G, Southgate WM, Vinci RJ, Sectish TC. *Pediatrics*. 2014 May;133(5):898-906. doi: 10.1542/peds.2013-2917. Epub 2014 Apr 14.

ABSTRACT:

The Accreditation Council for Graduate Medical Education has partnered with member boards of the American Board of Medical Specialties to initiate the next steps in advancing competency-based assessment in residency programs. This initiative, known as the Milestone Project, is a paradigm shift from traditional assessment efforts and requires all pediatrics residency programs to report individual resident progression along a series of 4 to 5 developmental levels of performance, or milestones, for individual competencies every 6 months beginning in June 2014. The effort required to successfully make this shift is tremendous given the number of training programs, training institutions, and trainees. However, it holds great promise for achieving training outcomes that align with patient needs; developing a valid, reliable, and meaningful way to track residents' development; and providing trainees with a roadmap for learning. Recognizing the resources needed to implement this new system, the authors, all residency program leaders, provide their consensus view of the components necessary for implementing and sustaining this effort, including resource estimates for completing this work. The authors have identified 4 domains: (1) Program Review and Development of Stakeholders and Participants, (2) Assessment Methods and Validation, (3) Data and Assessment System Development, and (4) Summative Assessment and Feedback. This work can serve as a starting point and framework for collaboration with program, department, and institutional leaders to identify and garner necessary resources and plan for local and national efforts that will ensure successful transition to milestones- based assessment.

Progress toward Improved Leadership and Management Training in Pathology

Weiss RL, Hassell LA, Parks ER. Arch Pathol Lab Med. 2014 Apr;138(4):492-7. doi: 10.5858/ arpa.2013-0288-RA.

CONTEXT:

Competency gaps in leadership and laboratory management skills continue to exist between what training programs deliver and what recent graduates and future employers expect. A number of recent surveys substantiate this. Interest in delivering content in these areas is challenged by time constraints, the presence of knowledgeable faculty role models, and the necessary importance placed on diagnostic skills development, which overshadows any priority trainees have toward developing these skills.

OBJECTIVE:

To describe the problem, the near-future horizon, the current solutions, and the recommendations for improving resident training in laboratory management.

DATA SOURCES:

The demands of new health care delivery models and the value being placed on these skills by the Pathology Milestones and Next Accreditation System initiative of the Accreditation Council for Graduate Medical Education for training programs emphasizes their importance. This initiative includes 6 milestone competencies in laboratory management. Organizations like the American Society for Clinical Pathology, the American Pathology Foundation, the College of American Pathologists, and the Association of Pathology Chairs Program Directors Section recognize these competencies and are working to create new tools for training programs to deploy.

CONCLUSIONS:

It is our recommendation that (1) every training program develop a formal educational strategy for management training, (2) greater opportunity and visibility be afforded for peer-reviewed publications on management topics in mainstream pathology literature, and (3) pathology milestones-oriented tools be developed to assist program directors and their trainees in developing this necessary knowledge and skills.

The Pathology Milestones and the Next Accreditation System

Naritoku WY, Alexander CB, Bennett BD, Black-Schaffer WS, Brissette MD, Grimes MM, Hoffman RD, Hunt JL, Iezzoni JC, Johnson R, Kozel J, Mendoza RM, Post MD, Powell SZ, Procop GW, Steinberg JJ, Thorsen LM, Nestler SP. Arch Pathol Lab Med. 2014 Mar;138(3):307-15. doi: 10.5858/ arpa.2013-0260-SA.

BACKGROUND:

In the late 1990s, the Accreditation Council for Graduate Medical Education developed the Outcomes Project and the 6 general competencies with the intent to improve the outcome of graduate medical education in the United States. The competencies were used as the basis for developing learning goals and objectives and tools to evaluate residents' performance. By the mid-2000s the stakeholders in resident education and the general public felt that the Outcomes Project had fallen short of expectations.

OBJECTIVE:

To develop a new evaluation method to track trainee progress throughout residency using benchmarks called milestones. A change in leadership at the Accreditation Council for Graduate Medical Education brought a new vision for the accreditation of training programs and a radically different approach to the evaluation of residents.

DATA SOURCES:

The Pathology Milestones Working Group reviewed examples of developing milestones in other specialties, the literature, and the Accreditation Council for Graduate Medical Education program requirements for pathology to develop pathology milestones. The pathology milestones are a set of objective descriptors for measuring progress in the development of competency in patient care, procedural skill sets, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice.

CONCLUSIONS:

The milestones provide a national standard for evaluation that will be used for the assessment of all residents in Accreditation Council for Graduate Medical Education-accredited pathology training programs.

Time to Trust: Longitudinal Integrated Clerkships and Entrustable Professional Activities

Hirsh DA, Holmboe ES, ten Cate O. Acad Med. 2014 Feb;89(2):201-4. doi: 10.1097/ACM.000000000000111.

ABSTRACT:

Medical education shaped by the learning sciences can better serve medical students, residents, faculty, health care institutions, and patients. With increasing innovation in undergraduate and graduate medical education and more focused attention on educational principles and how people learn, this era of educational transformation offers promise. Principles manifest in "educational continuity" are informing changes in educational structures and venues and are enriching new discourse in educational pedagogy, assessment, and scholarship. The articles by Myhre and colleagues and Woloschuk and colleagues in this issue, along with mounting evidence preceding these works, should reassure that principle-driven innovation in medical education is not only possible but can be achieved safely. In this commentary, the authors draw from these works and the wider literature on longitudinal integrated educational design. They suggest that the confluences of movements for longitudinal integrated clerkships and entrustable professional activities open new possibilities for other educational and practice advancements in quality and safety. With the advent of competency-based education, explicit milestones, and improved assessment regimens, overseers will increasingly evaluate students, trainees, and other learners on their ability rather than relying solely on time spent in an activity. The authors suggest that, for such oversight to have the most value, assessors and learners need adequate oversight time, and redesign of educational models will serve this operational imperative. As education leaders are reassessing old medical school and training models, rotational blocks, and other barriers to progress, the authors explore the dynamic interplay between longitudinal integrated learning models and entrustment.

Early Feedback on the Use of the Internal Medicine Reporting Milestones in Assessment of Resident Performance

Aagaard E, Kane GC, Conforti L, Hood S, Caverzagie KJ, Smith C, Chick DA, Holmboe ES, Iobst WF. J Grad Med Educ. 2013 Sep;5(3):433-8

BACKGROUND:

The educational milestones were designed as a criterion-based framework for assessing resident progression on the 6 Accreditation Council for Graduate Medical Education competencies.

OBJECTIVE:

We obtained feedback on, and assessed the construct validity and perceived feasibility and utility of, draft Internal Medicine Milestones for Patient Care and Systems-Based Practice.

METHODS:

All participants in our mixed-methods study were members of competency committees in internal medicine residency programs. An initial survey assessed participant and program demographics; focus groups obtained feedback on the draft milestones and explored their perceived utility in resident assessment, and an exit survey elicited input on the value of the draft milestones in resident assessment. Surveys were tabulated using descriptive statistics. Conventional content analysis method was used to assess the focus group data.

RESULTS:

Thirty-four participants from 17 programs completed surveys and participated in 1 of 6 focus groups. Overall, the milestones were perceived as useful in formative and summative assessment of residents. Participants raised concerns about the length and complexity of some draft milestones and suggested specific changes. The focus groups also identified a need for faculty development. In the exit survey, most participants agreed that the Patient Care and Systems-Based Practice Milestones would help competency committees assess trainee progress toward independent practice.

CONCLUSIONS:

Draft reporting milestones for 2 competencies demonstrated significant construct validity in both the content and response process and the perceived utility for the assessment of resident performance. To ensure success, additional feedback from the internal medicine community and faculty development will be necessary.

The ACGME Milestone Project in Ophthalmology

Lee AG, Arnold AC. *Surv Ophthalmol*. 2013 Jul-Aug;58(4):359-69. doi: 10.1016/j.survophthal. 2013.01.002.

ABSTRACT:

The ACGME is moving towards the next generation of accreditation in the USA called the Next Accreditation System (NAS). The NAS is anticipated to reduce the burden on programs to comply with accreditation requirements; to produce meaningful, innovative, and continuous benchmark outcomes data; to use ongoing individual and programmatic milestones to judge performance; and ultimately to produce better trained residents, to improve the quality of care, to reduce health care costs and health care disparities, and to provide objective evidence to the public and other external stakeholders of the quality of graduate medical education across the specialties of medicine. We describe the ACGME milestone development process for ophthalmology. If successful, the NAS will benefit all programs by reducing the programmatic burden and paperwork; increasing accreditation cycle length; and improving all programs through formative and summative feedback.

The Development of the Emergency Medicine Milestones

Beeson MS, Carter WA, Christopher TA, Heidt JW, Jones JH, Meyer LE, Promes SB, Rodgers KG, Shayne PH, Swing SR, Wagner MJ. Acad Emerg Med. 2013 Jul;20(7):724-9. doi: 10.1111/acem.12157. Epub 2013 Jun 19.

ABSTRACT:

The Accreditation Council for Graduate Medical Education (ACGME) has outlined its "Next Accreditation System" (NAS) that will focus on resident and residency outcome measurements. Emergency medicine (EM) is one of seven specialties that will implement the NAS beginning July 2013. All other specialties will follow in July 2014. A key component of the NAS is the development of assessable milestones, which are explicit accomplishments or behaviors that occur during the process of residency education. Milestones describe competencies more specifically and identify specialty-specific knowledge, skills, attitudes, and behaviors (KSABs) that can be used as outcome measures within the general competencies. The ACGME and the American Board of Emergency Medicine (ABEM) convened an EM milestone working group to develop the EM milestones. This article describes the development, use within the NAS, and challenges of the EM milestones.

Educational Milestone Development in the First 7 Specialties to Enter the Next Accreditation System

Swing SR, Beeson MS, Carraccio C, Coburn M, Iobst W, Selden NR, Stern PJ, Vydareny K. J Grad Med Educ. 2013 Mar;5(1):98-106. doi: 10.4300/JGME-05-01-33.

BACKGROUND:

The Accreditation Council for Graduate Medical Education (ACGME) Outcome Project introduced six general competencies relevant to medical practice but fell short of its goal to create a robust assessment system that would allow program accreditation based on outcomes. In response, the ACGME, the specialty boards, and other stakeholders collaborated to develop educational milestones, observable steps in residents' professional development that describe progress from entry to graduation and beyond.

OBJECTIVES:

We summarize the development of the milestones, focusing on 7 specialties, moving to the next accreditation system in July 2013, and offer evidence of their validity.

METHODS:

Specialty work groups with broad representation used a 5-level developmental framework and incorporated information from literature reviews, specialty curricula, dialogue with constituents, and pilot testing.

RESULTS:

The work groups produced richly diverse sets of milestones that reflect the community's consideration of attributes of competence relevant to practice in the given specialty. Both their development process and the milestones themselves establish a validity argument, when contemporary views of validity for complex performance assessment are used.

CONCLUSIONS:

Initial evidence for validity emerges from the development processes and the resulting milestones. Further advancing a validity argument will require research on the use of milestone data in resident assessment and program accreditation.

Operationalizing the Internal Medicine Milestones – An Early Status Report

Nabors C, Peterson SJ, Forman L, Stallings GW, Mumtaz A, Sule S, Shah T, Aronow W, Delorenzo L, Chandy D, Lehrman SG, Frishman WH, Holmboe E. J Grad Med Educ. 2013 Mar;5(1):130-7. doi: 10.4300/JGME-D-12-00130.1.

BACKGROUND:

The internal medicine milestones were developed to advance outcomes-based residency training and will play an important role in the next accreditation system.

INNOVATION:

As an element of our program's participation in the internal medicine educational innovations project, we implemented a milestones-based evaluation process in our general medicine and pulmonary-critical care rotations on July 1, 2010.

MEASURES:

Outcomes assessed included survey-rated acceptability to participating faculty, residents, and clinical competency committee members.

RESULTS:

Faculty and residents agreed that the milestones promoted a common understanding of what knowledge, skills, and attitudes should be displayed at particular points in residents' professional development and enhanced evaluators' ability to provide specific performance feedback. Most residents and faculty members agreed that the milestones promoted fairness and uniformity in the evaluation process. Clinical competency committee members agreed the milestones improved the quality of information available for deliberations and resulted in more uniform promotion standards. Faculty rated the use of too many milestones per form/tool at a mean of 7.3 (where 1 was minimally problematic, and 10 was maximally problematic) and the potential for evaluator fatigue (mean, 8.2) as the most significant challenges to the use of milestones. Eight of 12 faculty members would recommend milestones in other programs; 4 were uncertain.

CONCLUSIONS:

Despite logistical challenges, educators and trainees found that milestones promoted a common understanding of what knowledge, skills and attitudes should be displayed at particular stages of training; permitted greater specificity in performance feedback; and enhanced uniformity and fairness in promotion decisions.

From Theory to Actual Practice: Creation and Application of Milestones in an Internal Medicine Residency Program, 2004-2010

Meade LB, Borden SH, McArdle P, Rosenblum MJ, Picchioni MS, Hinchey KT. Med Teach. 2012;34(9):717-23. doi: 10.3109/0142159X.2012.689441. Epub 2012 May 30.

BACKGROUND:

In the USA, the Accreditation Council of Graduate Medical Education, Educational Innovations Project is a partner in reshaping residency training to meet increasingly complex systems of health care delivery.

AIM:

We describe the creation and implementation of milestones as a vehicle for translating educational theory into practice in preparing residents to provide safe, autonomous patient care.

METHOD:

Six program faculty leaders, all with advanced medical education training, met in an iterative process of developing, implementing, and modifying milestones until a final set were vetted.

RESULTS:

We first formed the profile of a Master Internist. We then translated it into milestone language and implemented its integration across the program. Thirty-seven milestones were applied in all settings and rotations to reach explicit educational outcomes. We created three types of milestones: Progressive, build one on top of the other to mastery; additive, adding multiple behaviors together to culminate in mastery; and descriptive, using a proscribed set of complex, predetermined steps toward mastery.

CONCLUSIONS:

Using milestones, our program has enhanced an educational model into explicit, end of training goals. Milestone implementation has yielded positive results toward competency-based training and others may adapt our strategies in a similar effort.

Milestones for Apheresis Education

Marshall CS, Andrzejewski C, Carey PM, Crookston KP, Li Y, Lopez-Plaza I, Sachais BS, Schwartz J, Winters JL, Wong EC, Wu Y. *J Clin Apher.* 2012 Nov;27(5):242-6. doi: 10.1002/jca.21235. Epub 2012 Jul 6.

ABSTRACT:

Milestones represent the essential knowledge, skills, and attitudes required for the practice of a medical discipline. Defining these milestones for each medical specialty has become a focus for the American Council of Graduate Medical Education (ACGME). Practitioners of Apheresis Medicine come from a variety of medical specialties making it challenging to establish the essential educational milestones for all. The American Society for Apheresis (ASFA) has an interest in promoting standards of excellence for Apheresis Medicine. ASFA's Physician's Curriculum Content Committee is a group of physician educators in the field of Apheresis Medicine, both donor and therapeutic, from across the United States, who have met regularly for several years to discuss the appropriate educational milestones in Apheresis training. The committee members teach residents and fellows from Pathology, Transfusion Medicine, Hematology/Oncology, Nephrology and other specialties. In this document, we have outlined the basic set of Apheresis milestones required in the ACGME defined competency areas of Patient Care and Medical Knowledge. We have also recommended methods of evaluation and estimated the time necessary for the acquisition of these cognitive and behavioral elements.