



**Content - Do the Milestones
Represent my
Specialty/Program?**

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 primary stakeholders involved in the ACGME Milestones Project are the ACGME, residency and fellowship programs, residents, fellows, and certification boards. The purpose of the Milestones is to outline the progression of a trainee's educational and professional development from the early stages of their postgraduate education to the completion of their clinical training.

The specialty-specific milestones that were developed demonstrate significant variability in terms of their content and how the developmental progression is defined across different milestone levels. The ACGME recognized in 2013 that the implementation of milestones would be an ongoing process that would require periodic review and revision as more experience and research evidence is collected. As part of a continuous quality improvement process, the ACGME committed to initiating this task within 3 to 5 years of Phase 1 implementation. Over the first three years of implementation, ACGME Milestone staff actively sought feedback from more than 200 program director meetings, focus groups, and visits to accredited programs and sponsoring institutions. This input helped to shape the revision process for Milestones 2.0.

What's in the literature:

The literature includes the development and writing process for different specialties, more information on interviews that were conducted of program directors, CCC chairs, and residents on their experiences with Milestone processes in their respective programs, how the writing committee's changes can help trainees, CCC members, and program directors find more meaning from their use, rationale behind 1.0 to 2.0 revisions, and a content analysis of narrative data collected from fellows' self-assessments while in a new clinical rotation.

Emergency medical services Milestones 2.0: What has changed?

Nesbit CE, Mastenbrook JD, Ball MT, Rinnert KJ, Edgar L. AEM Educ Train. 2022 Dec 8;6(6):e10821. doi: 10.1002/aet2.10821. PMID: 36518230; PMCID: PMC9731298.

BACKGROUND:

Since 2015, development of competencies by emergency medical services (EMS) fellows have been evaluated using the EMS Milestones 1.0 developed by a working group consisting of relevant stakeholders convened by the Accreditation Council for Graduate Medical Education (ACGME). Feedback from users and data collected from the milestones assessments in the interim indicated a need for revision of the original milestones. In May 2021, the Milestones 2.0 working group was convened for the purpose of revising this specialty-specific assessment tool.

METHODS:

A working group consisting of representatives from American Board of Emergency Medicine, the Review Committee for Emergency Medicine, and volunteers selected by the ACGME Milestones Committee, chaired by the ACGME vice president for milestones development, was convened using a virtual platform to revise the milestones and develop a supplemental guide for use along with the Milestones 2.0. There were no in-person meetings of this working group due to the COVID-19 pandemic.

RESULTS:

Data from milestones reporting, discussion within the working group, stakeholder input, and public commentary were used to revise the original milestones. A new supplemental guide to enhance milestone usability and provide recommended resource materials was also developed for use alongside the milestones.

DISCUSSION:

The EMS Milestones 2.0 and accompanying supplemental guide provide an updated framework for fellowship programs to use as a guide for developing the competencies necessary for independent practice as EMS physicians and in the formal, competency-based evaluation of trainees as required by the ACGME.

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.

Epilepsy Milestones 2.0: An updated framework for assessing epilepsy fellowships and fellows

Thio LL, Edgar L, Ali I, Farooque P, Holland KD, Mizrahi EM, Shahid AM, Shin HW, Yoo JY, Carlson C. *Epilepsia*. 2022 Aug;63(8):2155-2163. doi: 10.1111/epi.17306. Epub 2022 May 26. PMID: 35582760.

OBJECTIVE:

Accreditation Council for Graduate Medical Education (ACGME)-accredited epilepsy fellowships, like other ACGME accredited training programs, use Milestones to establish learning objectives and to evaluate how well trainees are achieving these goals. The ACGME began developing the second iteration of the Milestones 6 years ago, and these are now being adapted to all specialties. Here, we describe the process by which Epilepsy Milestones 2.0 were developed and summarize them.

METHODS:

A work group of nine board-certified, adult and pediatric epileptologists reviewed Epilepsy Milestones 1.0 and revised them using a modified Delphi approach.

RESULTS:

The new Milestones share structural changes with all other specialties, including a clearer stepwise progression in professional development and the harmonized Milestones that address competencies common to all medical fields. Much of the epilepsy-specific content remains the same, although a major addition is a set of Milestones focused on reading and interpreting electroencephalograms (EEGs), which the old Milestones lacked. Epilepsy Milestones 2.0 includes a Supplemental Guide to help program directors implement the new Milestones. Together, Epilepsy Milestones 2.0 and the Supplemental Guide recognize advances in epilepsy, including stereo-EEG, neurostimulation, genetics, and safety in epilepsy monitoring units.

SIGNIFICANCE:

Epilepsy Milestones 2.0 address the shortcomings of the old Milestones and should facilitate the assessment of epilepsy fellowships and fellows by program directors, faculty, and fellows themselves.

Translation and Transcultural Adaptation of the Milestones Instrument to Assess Teaching in Medical Residency Services on Orthopedics and Traumatology

Castro UB, Gomes GR, Simão KFR, Egito LJCD, Figueiredo SDFA, Júnior RZB. Rev Bras Ortop (Sao Paulo). 2022 Jul 22;57(5):795-801. doi: 10.1055/s-0042-1748942. PMID: 36226218; PMCID: PMC9550361.

OBJECTIVE:

Orthopedics is not very common in many Brazilian medical schools, and there is no questionnaire to assess the teaching of musculoskeletal disorders during medical training. The Orthopedic Surgery Milestone Project is an assessment tool for orthopedic residents in programs or fellowships recognized by the Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Orthopedic Surgery (ABOS). This study aims to translate the Orthopedic Surgery Milestone Project into Portuguese and to perform its transcultural adaptation.

METHODS:

The translation and transcultural adaptation consisted of the initial translation into Portuguese, back-translation into English, preparation of a pretest consensual text, and the subsequent elaboration of a final text.

RESULTS:

The final text was deemed adequate and equivalent to the original one for the evaluation of orthopedics residents throughout their program.

CONCLUSIONS:

Given the lack of instruments for the assessment of orthopedic residents, the translation and transcultural adaptation of the Orthopedic Surgery Milestone Project were compatible; this can be an instrument for improved medical education.

Milestones 2.0: Otolaryngology Resident Competency in the Postpandemic Era

Cabrera-Muffly C, Cusumano C, Freeman M, Jardine D, Lieu J, Manes RP, Marple B, Puscas L, Svrakic M, Thorne M, Edgar L. *Otolaryngol Head Neck Surg.* 2022 Apr;166(4):605-607. doi: 10.1177/01945998211033235. Epub 2021 Jul 27. PMID: 34313511.

ABSTRACT:

The Accreditation Council for Graduate Medical Education and the American Board of Otolaryngology-Head and Neck Surgery Milestones Project grew out of a continued need to document objective outcomes within resident education. Milestones 2.0 began its work in 2016, with an intent to resolve inconsistencies in the original milestones based on an iterative process. Milestones 2.0 retains the original 5 levels of achievement but includes a "not yet assessable" option as well. In addition, Milestones 2.0 has added harmonized milestones across all specialties. Each specialty has incorporated a supplemental guide with examples and resources to improve facility with the tool. There will be further refinement of the Milestones as new research emerges with the ultimate goal of providing programs and trainees with a reliable roadmap that can be used to direct and assess learning.

Challenges of Assessing Resident Competency in Well-Being: Development of the Psychiatry Milestones 2.0 Well-Being Subcompetency

Houston LJ, DeJong SM, Brenner AM, Macaluso M, Kinzie JM, Arbuckle MR, Janssen F, Cowley DS, Bentman AL. *Acad Med.* 2022 Mar 1;97(3):351-356. doi: 10.1097/ACM.0000000000004220. PMID: 34192719.

ABSTRACT:

Burnout and depression are major problems facing physicians, with 300-400 physicians dying by suicide each year. In an effort to address this issue, the Accreditation Council for Graduate Medical Education (ACGME) revised the Common Program Requirements for residency and fellowship programs to include a strong emphasis on well-being, and this revision has been extended to including a subcompetency on well-being in the Milestones 2.0. The Psychiatry Milestones 2.0 Work Group was convened to draft updated psychiatry milestones. As part of the open feedback period, the American Association of Directors of Psychiatric Residency Training submitted an organizational letter outlining several points to consider regarding the original draft of the well-being subcompetency. The ACGME was receptive to this feedback and allowed the Psychiatry Milestones 2.0 Work Group to revise the subcompetency. Current research indicates that burnout is largely driven by systemic factors, but well-being literature and initiatives often focus on individual factors and responsibility for burnout rather than systemic change. Program directors tasked with assessing resident well-being can additionally encounter several professionalism concerns, including how to (1) define a subcompetency within a competency that itself has not been well defined; (2) decide the appropriate balance between individual and systemic responsibility for well-being; (3) consider mental health as a parameter of well-being; (4) balance roles as physicians, psychiatrists, and training directors in thinking about the mental health of residents without overstepping boundaries and while maintaining privacy, confidentiality, and resident safety; and (5) measure well-being in a sociocultural context. This article describes how these considerations were incorporated into the revision of the Psychiatry Milestones 2.0 version of the well-being subcompetency, which has subsequently been made available to other specialty work groups for potential use as they develop their specialty-specific Milestones 2.0.

ACGME Interventional Cardiology Milestones 2.0-an overview: Endorsed by the Accreditation Council for Graduate Medical Education

Ijioma NN, Don C, Arora V, Edgar L, Hawkins B, Monteleone P, Tchong JE, Helmy T. Catheter Cardiovasc Interv. 2022 Feb;99(3):777-785. doi: 10.1002/ccd.29975. Epub 2021 Oct 28. PMID: 34708916.

ABSTRACT:

This document provides an overview of the rationale, development, interpretation, and practical suggestions for implementation of the new Accreditation Council for Graduate Medical Education (ACGME) Interventional Cardiology (IC) Milestones 2.0. Previously, IC programs used the general ACGME Milestones for internal medicine. The IC Milestones version 2.0 updates the ACGME competencies to be specific to training in IC. In 2019 an ACGME working group consisting of IC program directors, a lay representative, and representatives from the American Board of Internal Medicine met to develop the IC Milestones version 2.0. The ACGME IC Milestones 2.0 establishes a framework for formative feedback for trainees within domains of patient care, medical knowledge, systems-based practice, practice-based learning and improvement, professionalism, and interpersonal and communication skills. The 2021 IC Milestones 2.0 provides a framework for IC mentors and trainees to identify areas for improvement or commendation help stimulate meaningful educational discussions, and provide the basis for self-reflection and self-improvement.

Updates in Forensic Pathology Education: ACGME Milestones 2.0

Forensic Pathology Working Group. Am J Forensic Med Pathol. 2021 Dec 1;42(4):313-317. doi: 10.1097/PAF.0000000000000689. PMID: 34091494.

ABSTRACT:

The Accreditation Council for Graduate Medical Education Milestones offer a framework for competency-based assessment of forensic pathology fellows. The initial forensic pathology- specific milestones (Milestones 1.0) were developed in 2014. Although a great foundation, this first iteration of the milestones was somewhat convoluted and exhibited areas of discrepancy. A Forensic Pathology Milestone 2.0 Working Group of 12 volunteers, with various levels of forensic pathology expertise representing a broad array of institutions across the United States, sought to reduce milestone complexity and modify the cross-specialty "harmonized" milestones to ensure they fit within the context of forensic pathology training. The group also created a supplemental guide to provide additional clarification for each milestone. Overall, 5 specialty- specific subcompetencies were drafted, and the language in the 14 harmonized subcompetencies was adjusted to reflect the unique population of patients and multidisciplinary medicolegal systems inherent to forensic pathology. Once the initial development was complete, the Milestones 2.0 draft was made available for review by the greater forensic pathology community, with the aim of creating a shared mental model for forensic pathology education and the trajectory of the field. Additional changes were made based on the survey results and Milestones 2.0 will be implemented during the 2021-2022 academic year.

ACGME Milestones 2.0: Why And What's New For Cytopathology?

Nayar R, Anderson S, Dyhdalo KS, Edgar L, Hatlak K, Henderson-Jackson E, McLean S, Rosenbaum MW, Rosenblum F, Naritoku WY. J Am Soc Cytopathol. 2021 Sep-Oct;10(5):485-494. doi: 10.1016/j.jasc.2021.04.003. Epub 2021 May 24. PMID: 34167909.

BACKGROUND:

Primary stakeholders in the Accreditation Council for Graduate Medical Education (ACGME) Milestones Project are: ACGME, Residency Programs, Residents, Fellowship Programs, Fellows, and Certification Boards. The intent of the Milestones is to describe the educational and professional developmental trajectory of a trainee from the first stages of their postgraduate education through the completion of their clinical training. The Milestones 2.0 project includes changes made based on experience with Milestones 1.0.

METHODS:

The ACGME solicited volunteers to participate in the development of subspecialty Milestones 2.0. The workgroup was charged with reviewing/making any additions to the four "Harmonized Milestones", developing subspecialty specific milestones for the Patient Care and Medical Knowledge competencies, and creating a supplemental guide. The Milestones were finalized following review of input from an open comment period.

RESULTS:

The Cytopathology Milestones 2.0 will go into effect July 2021. They include additional subcompetencies in the 4 harmonized competency areas and cytopathology-specific edits to the patient care and medical knowledge subcompetencies. Although the number of subcompetencies has increased from 18 to 21, within each subcompetency, the number of milestone trajectories has decreased. Additionally, within each subcompetency, the wording has been streamlined. A supplemental guide was created and Milestones 1.0 were compared to 2.0; however, curriculum mapping has been left to programs to develop.

CONCLUSIONS:

The ultimate goal of the Cytopathology Milestones 2.0 is to provide better real-time documentation of the progress of cytopathology fellows. The expected outcome is to produce highly competent cytopathologists, improving the care they provide, regardless of the program at which they trained.

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.

The Emergency Medicine Milestones 2.0: Setting the Stage for 2025 and Beyond

Cooney RR, Murano T, Ring H, Starr R, Beeson MS, Edgar L. AEM Educ Train. 2021 Jul 1;5(3):e10640. doi: 10.1002/aet2.10640. PMID: 34471793; PMCID: PMC8325436.

INTRODUCTION:

Beginning in 1999, residents in emergency medicine have been expected to demonstrate competence in the six Accreditation Council on Graduate Medical Education (ACGME) Core Competencies. Expectations were further refined and clarified through the introduction of the Milestones in 2013. Emerging research and data from milestone reporting has illustrated the need for modification of the original milestones. Against this backdrop, the ACGME convened a committee to review and revise the original milestones.

METHODS:

The working group was convened in December 2018 and consisted of representatives from the American Board of Emergency Medicine, American Osteopathic Association, Council of Residency Directors in Emergency Medicine, Association of American Medical Colleges, ACGME-Emergency Medicine Review Committee, three community members, a resident member, and a public member. This group also included members from both academic and community emergency medicine programs. The group was overseen by the ACGME vice president for milestones development and met in person one time followed by four virtual sessions to revise and draft the Emergency Medicine Milestones and Supplemental Guide as part of the ACGME Milestones 2.0 Project.

RESULTS:

Using data from milestones reporting, needs assessment data, stakeholder interviews, and community commentary, the working group engaged in revisions and updates for the Emergency Medicine Milestones and created a supplemental guide to aid programs in the design of programmatic assessment for the milestones.

CONCLUSIONS:

The Emergency Medicine Milestones 2.0 provide updated specialty-specific, competency-based behavioral anchors to guide the assessment of residents, the design of curricula, and the advancement of emergency medicine training programs.

Stages of Milestones Implementation: A Template Analysis of 16 Programs Across 4 Specialties

Yaghmour NA, Poulin LJ, Bernabeo EC, Ekpenyong A, Li ST, Eden AR, Hauer KE, Tichter AM, Hamstra SJ, Holmboe ES. *J Grad Med Educ.* 2021 Apr;13(2 Suppl):14-44. doi: 10.4300/JGME-D-20-00900.1. Epub 2021 Apr 23. PMID: 33936531; PMCID: PMC8078079.

BACKGROUND:

Since 2013, US residency programs have used the competency-based framework of the Milestones to report resident progress and to provide feedback to residents. The implementation of Milestones-based assessments, clinical competency committee (CCC) meetings, and processes for providing feedback varies among programs and warrants systematic examination across specialties.

OBJECTIVE:

We sought to determine how varying assessment, CCC, and feedback implementation strategies result in different outcomes in resource expenditure and stakeholder engagement, and to explore the contextual forces that moderate these outcomes.

METHODS:

From 2017 to 2018, interviews were conducted of program directors, CCC chairs, and residents in emergency medicine (EM), internal medicine (IM), pediatrics, and family medicine (FM), querying their experiences with Milestone processes in their respective programs. Interview transcripts were coded using template analysis, with the initial template derived from previous research. The research team conducted iterative consensus meetings to ensure that the evolving template accurately represented phenomena described by interviewees.

RESULTS:

Forty-four individuals were interviewed across 16 programs (5 EM, 4 IM, 5 pediatrics, 3 FM). We identified 3 stages of Milestone-process implementation, including a resource-intensive early stage, an increasingly efficient transition stage, and a final stage for fine-tuning.

CONCLUSIONS:

Residency program leaders can use these findings to place their programs along an implementation continuum and gain an understanding of the strategies that have enabled their peers to progress to improved efficiency and increased resident and faculty engagement.

Developing a New Set of ACGME Milestones for Child Neurology Residency

Albert DVF, Bass N, Bodensteiner J, Draconi C, Duke ES, Felker M, Gropman A, Lotze T, Mink JW, Reese JJ Jr, Spiciarich M, Urion DK, Edgar L. *Pediatr Neurol.* 2021 Jan;114:47-52. doi: 10.1016/j.pediatrneurol.2020.10.008. Epub 2020 Oct 24. PMID: 33212335.

BACKGROUND:

The Educational Milestones developed by the Accreditation Council for Graduate Medical Education (ACGME) are a construct used to evaluate the development of core competencies during residency and fellowship training. The milestones were developed to create a framework for professional development during graduate medical education. The first iteration of milestones for the child neurology residency was implemented in 2015. In the years that followed, the ACGME received and reviewed feedback about the milestones and set out to revise them.

METHODS:

A committee was assembled to review the original milestones and develop a new set of milestones. The group was also encouraged to not only consider the child neurology residency graduate of today but also the graduate of tomorrow, taking into account growing fields such as genetics and technology.

RESULTS:

A diverse group of 12 individuals, including 10 child neurologists (all of whom were current or previous program directors or associate program directors), one child neurology resident, and one non-physician program coordinator, were recruited from programs of varying size across the country.

CONCLUSIONS:

The committee developed a revision to the child neurology milestones. All changes made were with a focus on how the milestones can be useful to trainees, program directors, and clinical competency committee members. Implementation and further feedback should help guide future revisions. These changes should help trainees, clinical competency committee members, and program directors find more meaning from their use.

Do Milestone Ratings Predict Physical Medicine and Rehabilitation Board Certification Examination Scores?

Francisco GE, Yamazaki K, Raddatz M, Sabharwal S, Robinson L, Kinney C, Holmboe E. *Am J Phys Med Rehabil.* 2021 Feb 1;100(2S Suppl 1):S34-S39. doi: 10.1097/PHM.0000000000001613. PMID: 33048889.

ABSTRACT

The Accreditation Council of Graduate Medical Education developed the Milestones to assist training programs in assessing resident physicians in the context of their participation in Accreditation Council of Graduate Medical Education-accredited training programs. Biannual assessments are done over a resident's entire training period to define the trajectory in achieving specialty-specific competencies. As part of its process of initial certification, the American Board of Physical Medicine and Rehabilitation requires successful completion of two examinations administered approximately 9 mos apart. The Part I Examination measures a single dimensional construct, physical medicine and rehabilitation medical knowledge, whereas Part II assesses the application of medical and psychiatric knowledge to multiple domains, including data acquisition, problem solving, patient management, systems-based practice, and interpersonal and communication skills through specific patient case scenarios. This study aimed to investigate the validity of the Milestones by demonstrating its association with performance in the American Board of Physical Medicine and Rehabilitation certifying examinations. A cohort of 233 physical medicine and rehabilitation trainees in 3-yr residency programs (postgraduate year 2 entry) in the United States from academic years 2014-2016, who also took the American Board of Physical Medicine and Rehabilitation Parts I and II certifying examinations between 2016 and 2018, were included in the study. Milestones ratings in four distinct observation periods were correlated with scores in the American Board of Physical Medicine and Rehabilitation Parts I and II Examinations. Milestones ratings of medical knowledge (but not patient care, professionalism, problem-based learning, interpersonal and communication skills, and systems-based practice) predicted performance in subsequent Part I American Board of Physical Medicine and Rehabilitation Examination, but none of the Milestone ratings correlated with Part II Examination scaled scores.

Developing a New Set of ACGME Milestones for Child Neurology Residency

Albert DVF, Bass N, Bodensteiner J, Draconi C, Duke ES, Felker M, Gropman A, Lotze T, Mink JW, Reese JJ Jr, Spiciarich M, Urion DK, Edgar L. *Pediatr Neurol*. 2021 Jan;114:47-52. doi: 10.1016/j.pediatrneurol. 2020.10.008. Epub 2020 Oct 24. PMID: 33212335.

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METHODS:

A committee was assembled to review the original milestones and develop a new set of milestones. The group was also encouraged to not only consider the child neurology residency graduate of today but also the graduate of tomorrow, taking into account growing fields such as genetics and technology.

RESULTS:

A diverse group of 12 individuals, including 10 child neurologists (all of whom were current or previous program directors or associate program directors), one child neurology resident, and one non-physician program coordinator, were recruited from programs of varying size across the country.

CONCLUSIONS:

The committee developed a revision to the child neurology milestones. All changes made were with a focus on how the milestones can be useful to trainees, program directors, and clinical competency committee members. Implementation and further feedback should help guide future revisions. These changes should help trainees, clinical competency committee members, and program directors find more meaning from their use.

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.

Association Between Entrustable Professional Activities and Milestones Evaluations: Real-time Assessments Correlate With Semiannual Reviews

Albright JB, Meier AH, Ruangvoravat L, VanderMeer TJ. *J Surg Educ.* 2020 Nov-Dec;77(6):e220- e228. doi: 10.1016/j.jsurg.2020.07.027. Epub 2020 Jul 31. PMID: 32747323.

OBJECTIVE:

Entrustable professional activities (EPAs) have been developed to refine competency-based education. The American Board of Surgery has initiated a 2-year pilot study to evaluate the impact of EPAs on the evaluation and feedback of surgical residents. The ACGME Milestones in Surgery is a semiannual competency-based evaluation program to measure resident progression through 16 professional attributes across 8 practice domains. The correlation between these 2 evaluation tools remains unclear. The purpose of this study is to evaluate this correlation through comparison of an EPA with the corresponding elements of the ACGME Milestones.

DESIGN:

From July, 2018 to October, 2019, all residents submitting EPA evaluations for gall bladder disease were evaluated for preoperative, intraoperative, and/or postoperative entrustability. The ratings were converted to a numerical rank from 0 to 4. Milestones scores from May 2019 and November 2019 were obtained for each resident, with scores ranging from 0 to 4. The gall bladder EPA incorporates the operative PC3 and MK2 and nonoperative PC1, PC2, and ICS3 components. Spearman rank correlation was conducted to evaluate the association between each resident's median EPA ranking and his/her milestones scores.

SETTING:

SUNY Upstate Medical University, Syracuse, NY, a university-based hospital.

PARTICIPANTS:

General surgery residents.

RESULTS:

Among 24 residents, 106 intraoperative EPA evaluations were. For both the May and November milestones, significant positive correlations were noted for PC3 (correlation coefficient $\rho = 0.690$, $p < 0.001$; $\rho = 0.876$, $p < 0.001$). Similarly, for MK2, a significant positive correlation was noted ($\rho = 0.882$, $p < 0.001$; $\rho = 0.759$, $p < 0.001$). Interestingly, significant positive correlations were also identified between the 3 nonoperative milestones and the intraoperative entrustability ranking.

CONCLUSIONS:

We observed significant correlations between EPAs for cholecystectomy and associated milestones evaluation scores. These findings indicate that EPAs may provide more timely and specific feedback than existing tools and, on aggregate, may improve upon existing formative feedback practices provided through the biannual evaluation of surgical residents.

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.

ABSTRACT:

In 1999, the American Board of Medical Specialties and Accreditation Commission 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.

Rheumatology Milestones 2.0: A Roadmap for Competency-Based Medical Training of Rheumatology Fellows in the 21st Century

Liebowitz JE, Torralba KD, Kolfenbach J, Marston B, Dua AB, O'Rourke KS, McKown K, Battistone MJ, Valeriano-Marcet J, Edgar L, McLean S, Gouze KR, Bolster MB. *Arthritis Care Res (Hoboken)*. 2020 Nov 12. doi: 10.1002/acr.24507. Epub ahead of print. PMID: 33181000.

OBJECTIVE:

Since 2014, rheumatology fellows have been assessed not only based on their ability to provide patient care and possess medical knowledge but also on their skill in serving as patient advocates, navigators of health systems, and members of a health care team. Such assessments have been carried out through the use of competency-based "milestones" from the Accreditation Council of Graduate Medical Education (ACGME). However, a needs assessment demonstrated interest in more context validity and subspecialty-relevance since the development of the ACGME Internal Medicine (IM) Subspecialty Reporting Milestones. The ACGME thus charged a working group to develop Rheumatology Milestones 2.0, as well as a Supplemental Guide to assist with implementation.

METHODS:

The Working Group, consisting of seven rheumatology program directors, two division directors, a community practice rheumatologist, a rheumatology fellow-in-training, and a public member who is a rheumatology patient, was overseen by the ACGME Vice President for Milestones Development and met through three 12-hour in-person meetings to compose the Rheumatology Specialty Milestones and Supplemental Guide within the ACGME Milestones 2.0 Project.

RESULTS:

Informed by the needs assessment data and stakeholders, the Working Group revised and adapted the ACGME IM Subspecialty Reporting Milestones to create a rheumatology-specific set of milestones and a Supplemental Guide for their implementation.

CONCLUSIONS:

The Rheumatology Milestones 2.0 provide a specialty-specific, competency-based evaluation tool that can be used by program directors, Clinical Competency Committees (CCC), and others to assess the competencies of rheumatology fellows during training and help measure readiness for independent practice.

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.

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.

Lack of Telemedicine Training in Academic Medicine: Are We Preparing the Next Generation?

Pourmand A, Ghassemi M, Sumon K, Amini SB, Hood C, Sikka N. *Telemed J E Health*. 2020 Apr 15. doi: 10.1089/tmj.2019.0287. [Epub ahead of print]

BACKGROUND:

Telemedicine focuses on providing medical care to patients in remote locations using telecommunication technologies. It has been shown to be cost-effective, improve health outcomes, and enhance patient satisfaction. This study examines the extent to which medical students and resident physicians are exposed to telemedicine during training.

MATERIALS AND METHODS:

The authors accessed the American College of Graduate Medical Education (ACGME) Residency Milestones from specialties and subspecialties mentioned in the 2018 Milestones National Report and searched for key terms, including "Technology," "Telemedicine," "Telehealth," "EMR," "Electronic Medical Record," "EHR," "Electronic Health Record," "Electronics," and "Social Media." The authors also accessed the 2018 American Association of Medical Colleges (AAMC) "Curriculum Inventory and Reports" to retrieve data from surveys of medical schools that included telemedicine in required courses and electives for medical students from 2013 to 2018.

RESULTS:

From the 104 ACGME specialty milestones, only one specialty (Child and Adolescent Psychiatry) mentioned telehealth in its ACGME Milestone document. According to the AAMC data the number of medical schools surveyed increased every academic year from 140 in 2013/2014 to 147 in 2017/2018, telemedicine education in medical school increased significantly from 41% in 2013/2014 to 60% in 2017/2018 ($p = 0.0006$). However, the growth in telemedicine education plateaued from 56% in 2015/2016 to 60% in 2017/2018 ($p = 0.47$).

CONCLUSION:

Familiarizing medical students with telemedicine is essential; the next generation of health care providers should be equipped with knowledge of telemedicine as a valuable skill to serve populations that do not have direct access to quality medical care. Methods of implementing telemedicine education into more medical schools and residency programs merits further study.

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.

Development of Subspecialty-Specific Reporting Milestones for Hospice and Palliative Medicine Fellowship Training in the US

Barnett M, Buckholz G, Christensen A, Hwang J, Johnston CB, Landzaat L, Lupu D, Morrison LJ, Okon T, Radwany S, Yang H, Edgar L, Gustin J. *J Pain Symptom Manage*. 2020 Jan 24. pii: S0885-3924(20)30060-9. doi: 10.1016/j.jpainsymman.2020.01.008. [Epub ahead of print]

ABSTRACT:

Continuing the transition to competency-based education, Hospice and Palliative Medicine (HPM) fellowship programs began using context-free reporting milestones (RMs) for Internal Medicine subspecialties in 2014 but quickly recognized they did not reflect the nuanced practice of the field. This article describes the development of 20 subspecialty-specific RMs through consensus group process and vetting by HPM educators. A workgroup of content experts employed an iterative consensus building process between December 2017 and February 2019 to draft new RMs and to create a Supplemental Guide that outlines the intent of each RM, examples of each developmental trajectory, assessment methods, and resources to guide educators. Program directors, program coordinators, and designated institutional officers were contacted directly to solicit feedback. The majority of respondents agreed or strongly agreed that each RM represented a realistic progression of knowledge, skills, and behaviors, and that the set of milestones adequately discriminated between meaningful levels of competency. Similarly, respondents felt that the Supplemental Guide was a useful resource. The result is a set of carefully developed and broadly vetted RMs that represent a progression of development for HPM physicians over one year of clinical fellowship training.

Which Emergency Medicine Milestone Sub-competencies are Identified Through Narrative Assessments?

Diller D, Cooper S, Jain A, Lam CN, Riddell J. West J Emerg Med. 2019 Dec 20;21(1):173-179. doi: 10.5811/westjem.2019.12.44468.

INTRODUCTION:

Evaluators use assessment data to make judgments on resident performance within the Accreditation Council for Graduate Medical Education (ACGME) milestones framework. While workplace-based narrative assessments (WBNA) offer advantages to rating scales, validity evidence for their use in assessing the milestone sub-competencies is lacking. This study aimed to determine the frequency of sub-competencies assessed through WBNA in an emergency medicine (EM) residency program.

METHODS:

We performed a retrospective analysis of WBNA of postgraduate year (PGY) 2-4 residents. A shared mental model was established by reading and discussing the milestones framework, and we created a guide for coding WBNA to the milestone sub-competencies in an iterative process. Once inter-rater reliability was satisfactory, raters coded each WBNA to the 23 EM milestone sub-competencies.

RESULTS:

We analyzed 2517 WBNA. An average of 2.04 sub-competencies were assessed per WBNA. The sub-competencies most frequently identified were multitasking, medical knowledge, practice-based performance improvement, patient-centered communication, and team management. The sub-competencies least frequently identified were pharmacotherapy, airway management, anesthesia and acute pain management, goal-directed focused ultrasound, wound management, and vascular access. Overall, the frequency with which WBNA assessed individual sub-competencies was low, with 14 of the 23 sub-competencies being assessed in less than 5% of WBNA.

CONCLUSION:

WBNA identify few milestone sub-competencies. Faculty assessed similar sub-competencies related to interpersonal and communication skills, practice-based learning and improvement, and medical knowledge, while neglecting sub-competencies related to patient care and procedural skills. These findings can help shape faculty development programs designed to improve assessments of specific workplace behaviors and provide more robust data for the summative assessment of residents.

How Well Do Core Faculty Understand The Emergency Medicine Milestones?

Sorge R, Li-Sauerwine S, Fernandez J, Hern G. West J Emerg Med. 2019 Dec 19;21(1):160-162. doi: 10.5811/westjem.2019.11.44289.

INTRODUCTION:

It is unclear how emergency medicine (EM) programs educate core faculty about the use of milestones in competency-based evaluations. We conducted a national survey to profile how programs educate core faculty regarding their use and to assess core faculty's understanding of the milestones.

METHODS:

Our survey tool was distributed over six months in 2017 via the Council of Emergency Medicine Residency Directors (CORD) listserv. Responses, which were de-identified, were solicited from program directors (PDs), assistant/associate program directors (APDs), and core faculty. A single response from a program was considered sufficient.

RESULTS:

Our survey had a 69.7% response rate (n=140/201). 62.9% of programs reported educating core faculty about the EM Milestones via the distribution of physical or electronic media. Although 82.6% of respondents indicated that it was important for core faculty to understand how the EM Milestones are used in competency-based evaluations, respondents estimated that 48.6% of core faculty possess "fair or poor" understanding of the milestones. Furthermore, only 50.7% of respondents felt that the EM Milestones were a valuable tool.

CONCLUSION:

These data suggest there is sub-optimal understanding of the EM Milestones among core faculty and disagreement as to whether the milestones are a valuable tool.

Recommendations From the Society for the Advancement of Transplant Anesthesiology: Liver Transplant Anesthesiology Fellowship Core Competencies and Milestones

Nguyen-Buckley C, Wray CL, Zerillo J, Gilliland S, Aniskevich S, Nicolau-Raducu R, Planinsic R, Srinivas C, Pretto EA Jr, Mandell MS, Chadha RM. *Semin Cardiothorac Vasc Anesth.* 2019 Dec;23(4):399-408. doi: 10.1177/1089253219868918. Epub 2019 Aug 12.

ABSTRACT:

Liver transplantation is a complex procedure performed on critically ill patients with multiple comorbidities, which requires the anesthesiologist to be facile with complex hemodynamics and physiology, vascular access procedures, and advanced monitoring. Over the past decade, there has been a continuing debate whether or not liver transplant anesthesia is a general or specialist practice. Yet, as significant data have come out in support of dedicated liver transplant anesthesia teams, there is not a guarantee of liver transplant exposure in domestic residencies. In addition, there are no standards for what competencies are required for an individual seeking fellowship training in liver transplant anesthesia. Using the Accreditation Council for Graduate Medical Education guidelines for residency training as a model, the Society for the Advancement of Transplant Anesthesia Fellowship Committee in conjunction with the Liver Transplant Anesthesia Fellowship Task Force has developed the first proposed standardized core competencies and milestones for fellowship training in liver transplant anesthesiology.

A Qualitative Study of Independent Home Visits by Hospice Fellows: Addressing Gaps in ACGME Milestones by Fostering Reflection and Self-Assessment

Samala RV, Hoeksema LJ, Colbert CY. *Am J Hosp Palliat Care*. 2019 Oct;36(10):885-892. doi: 10.1177/1049909119836218. Epub 2019 Mar 13.

BACKGROUND:

With the rapid growth in the number of fellowship programs in Hospice and Palliative Medicine (HPM), many are in the process of developing ways to demonstrate that fellows are attaining educational milestones. Reflection and self-assessment are key components of 2 Accreditation Council for Graduate Medical Education (ACGME) competencies, practice-based learning and improvement, and systems-based practice, which have both been historically challenging to learn and assess.

OBJECTIVE:

This article describes results of a content analysis of narrative data collected from HPM fellows' self-assessments as they performed hospice home visits independently in a new clinical rotation.

DESIGN:

This was a prospective qualitative study.

SETTINGS/PARTICIPANTS:

Eight fellows completed 217 unsupervised hospice home visits from 2014 to 2016.

MEASUREMENTS:

Fellows completed weekly self-assessment forms, which captured both clinical visit information and practice data elicited from responses to open-ended reflection prompts.

RESULTS:

Analysis of 29 self-assessment forms generated 6 themes: patient- and family-centered care, self-efficacy, systems-based care, commitment to doing their best, catalyst for professional growth, and purpose and meaning in work. The fellows recognized numerous barriers distinct to providing care in homes. All fellows felt prepared to perform home visits throughout the rotation and after training.

CONCLUSIONS:

Narrative data collected during the independent home visit rotation provided evidence that HPM fellows detected gaps in their performance, planned for practice improvements in subsequent visits, and valued working within an interprofessional team. Built-in opportunities for fellows to reflect during training are critical in meeting ACGME milestones, and are integral to their professional development.

A Content Analysis of the ACGME Specialty Milestones to Identify Performance Indicators Pertaining to the Development of Residents as Educators

Michael SH, Rougas S, Zhang XC, Clyne B. Teach Learn Med. 2019 Aug- Sep;31(4):424-433. doi: 10.1080/10401334.2018.1560298. Epub 2019 Jan 22.

CONSTRUCT:

For curriculum development purposes, this study examined how the development of residents as educators is reflected in the Accreditation Council for Graduate Medical Education (ACGME) Milestones.

BACKGROUND:

Residents teach patients, families, medical students, physicians, and other health professionals during and beyond their training. Despite this expectation, it is unclear how the development of residents as educators is reflected in the specialty-specific Milestones.

APPROACH:

We performed a textual content analysis of 25 specialty Milestone documents available as downloads from the ACGME website in December 2015. Syntactical units of interest included developmental progressions that describe the development of educators over the course of residency training and 16 keyterms identified during the analysis. We then categorized the terms by associated Milestone level, ACGME core competency, and targeted learner(s).

RESULTS:

We identified 10 developmental progressions and 546 instances of the 16 key terms that describe the development of physician educators. The frequency of terms among specialties was quite variable (5-46 terms per specialty, Mdn = 21). The majority of education-related terms appeared at advanced Milestone levels; there were 139 (26%) such instances in Level 4 and 296 (54%) in Level 5. Education-related terms were identified in all six ACGME core competencies, with greatest frequency in Patient Care (157, 29%). Other residents were the learners most frequently targeted by education-related Milestones (211, 40%).

CONCLUSIONS:

The current ACGME Milestones largely imply that resident teaching is a high-level or aspirational goal, achieved without a clear or consistently assessed developmental progression. These findings run counter to the theoretical basis that underlies the development of the Milestones. Wide variation among specialties indicates lack of consensus around the ideal skill set of the resident educator and limits the utility of these documents for curriculum development in this domain.

Annotated Bibliography for Supervising Psychiatry Residents in Psychodynamic Psychotherapy

Miller CWT, Hodzic V, Ross DR, Ehrenreich MJ. Acad Psychiatry. 2019 Aug;43(4):417-424. doi: 10.1007/s40596-019-01056-4. Epub 2019 Apr 17.

OBJECTIVE:

This paper sought to compile an annotated bibliography for the outpatient year of adult psychiatry residents, providing resources for a foundation in psychodynamic theory which can be utilized in supervision to aid in ongoing psychotherapeutic work.

METHODS:

In selecting the readings, the ACGME Milestones sub-competencies considered were (i) empathy and process, (ii) boundaries, (iii) alliance and provision of psychotherapies, (iv) seeking and providing supervision, and (v) knowledge of psychotherapy (theories, practice, and evidence base). Once the readings were selected, two authors independently reviewed the articles to determine which key sub-competencies each article addressed. Chance corrected agreement between the reviewers was assessed using the Cohen kappa statistic. The kappa for interrater agreement was 0.83.

RESULTS:

A list of 32 readings was compiled sequentially, allowing for theoretical concepts to be progressively built upon. The content of the papers aligned well with multiple sub-competencies in the medical knowledge (MK) and patient care (PC) domains. The bibliography allows for close examination of therapeutic frame; active listening and reflecting on the meaning of the therapist's interventions; transference and the use of countertransference as a diagnostic/therapeutic tool; defense mechanisms; patient pressures towards reenactment; theoretical viewpoints on therapeutic action (e.g., ego psychology, self-psychology, relational therapy, object relations, classical/modern Kleinian); and meaning of lateness, treatment breaks, and termination.

CONCLUSIONS:

This list serves as an ancillary resource which can augment discussions in therapy supervision, while also aiding in standardizing the minimal knowledge base achieved in psychodynamic theory.

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.

What Do Quantitative Ratings and Qualitative Comments Tell Us about General Surgery Residents' Progress toward Independent Practice? Evidence from a 5-Year Longitudinal Cohort

Tekian A, Borhani M, Tilton S, Abasolo E, Park YS. Am J Surg. 2019 Feb;217(2):288-295. doi: 10.1016/j.amjsurg.2018.09.031. Epub 2018 Sep 29.

BACKGROUND:

This study examines the alignment of quantitative and qualitative assessment data in end-of-rotation evaluations using longitudinal cohorts of residents progressing throughout the five-year general surgery residency.

METHODS:

Rotation evaluation data were extracted for 171 residents who trained between July 2011 and July 2016. Data included 6069 rotation evaluations forms completed by 38 faculty members and 164 peer- residents. Qualitative comments mapped to general surgery milestones were coded for positive/ negative feedback and relevance.

RESULTS:

Quantitative evaluation scores were significantly correlated with positive/negative feedback, $r=0.52$ and relevance, $r=-0.20$, $p<.001$. Themes included feedback on leadership, teaching contribution, medical knowledge, work ethic, patient-care, and ability to work in a team-based setting. Faculty comments focused on technical and clinical abilities; comments from peers focused on professionalism and interpersonal relationships.

CONCLUSIONS:

We found differences in themes emphasized as residents progressed. These findings underscore improving our understanding of how faculty synthesize assessment data.

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.

Aligning Geriatric Medicine Fellowships with the Program of All-Inclusive Care for the Elderly (PACE)

McNabney MK, Suh TT, Sellers V, Wilner D. Gerontol Geriatr Educ. 2018 Dec 18:1-11. doi: 10.1080/02701960.2018.1532891.

ABSTRACT:

Geriatric medicine fellowship programs provide comprehensive training to one-year clinical fellows and must demonstrate successful progression of competence among fellows by reporting on 23 milestones to the Accreditation Council for Graduate Medical Education (ACGME). The Program of All-inclusive Care for the Elderly (PACE) is a model of care located throughout the United States and can serve as a training venue for fellows. We surveyed 113 fellowship program directors with a response rate of 42% (n = 48). The purpose of the survey was to assess: (1) familiarity and access to PACE and (2) perceived value of PACE to the fellowship program with regard to training and ability to achieve success in the 23 reporting milestones. Milestones involving communication and team management skills were most consistently identified as very valuable with a PACE clinical rotation. We then convened a focus group of four PACE medical directors who developed a fellowship curriculum for use in training fellows at PACE. We discuss the limitations of our design as well as the opportunities to build on the strengths of that model as a training site for fellows.

Radiology Education in Medical School and Residency: The Views and Needs of Program Directors

Schiller PT, Phillips AW, Straus CM. Acad Radiol. 2018 Oct;25(10):1333-1343. doi: 10.1016/j.acra.2018.04.004. Epub 2018 May 7.

RATIONALE AND OBJECTIVES:

The authors of this study used the perspectives of residency program directors (PDs) nationally to explore whether trainees are adequately prepared to utilize and interpret medical imaging as interns, to identify the types of imaging skills most important for residency, and to begin to address current shortcomings in radiology education.

MATERIALS AND METHODS:

The authors created a survey using a modified version of Accreditation Council for Graduate Medical Education radiology milestones and sent it to 100 randomly selected PDs each in pediatrics, internal medicine, obstetrics and gynecology, and general surgery. The survey asked PDs to assess the actual and desired imaging skills of their incoming interns, the incoming interns' variability of skill level upon matriculation, and which imaging skills were most important from the PDs' perspective.

RESULTS:

PDs from all specialties identified a significant shortcoming relative to their expectations for both image interpretation and utilization skills. Additionally, PDs identified a significant variability in imaging skills, and described that variability as a hindrance to their programs. All of the potential imaging skills were rated as highly important with little clinically relevant difference between them.

DISCUSSION:

This multidisciplinary national survey found a deficiency in imaging education among interns across specialties and substantiates calls for formalized and improved radiology education in undergraduate medical education. Additionally, PDs had difficulty distinguishing which skills were most important, suggesting an unclear understanding of imaging ability needs for interns in respective specialties. More specific needs assessments are warranted on a national level.

Challenges in Measuring ACGME Competencies: Considerations for Milestones

Natesan P, Batley NJ, Bakhti R, El-Doueihi PZ. *Int J Emerg Med.* 2018 Sep 28;11(1):39. doi: 10.1186/s12245-018-0198-3.

BACKGROUND:

Measuring milestones, competencies, and sub-competencies as residents progress through a training program is an essential strategy in Accreditation Council for Graduate Medical Education (ACGME)'s attempts to ensure graduates meet expected professional standards. Previous studies have found, however, that physicians make global ratings often by using a single criterion.

METHODS:

We use advanced statistical analysis to extend these studies by examining the validity of ACGME International competency measures for an international setting, across emergency medicine (EM) and neurology, and across evaluators. Confirmatory factor analysis (CFA) models were fitted to both EM and neurology data. A single-factor CFA was hypothesized to fit each dataset. This model was modified based on model fit indices. Differences in how different EM physicians perceived the core competencies were tested using a series of measurement invariance tests.

RESULTS:

Extremely high alpha reliability coefficients, factor coefficients ($> .93$), and item correlations indicated multicollinearity, that is, most items being evaluated could essentially replace the underlying construct itself. This was true for both EM and neurology data, as well as all six EM faculty.

CONCLUSIONS:

Evaluation forms measuring the six core ACGME competencies did not possess adequate validity. Severe multicollinearity exists for the six competencies in this study. ACGME is introducing milestones with 24 sub-competencies. Attempting to measure these as discrete elements, without recognizing the inherent weaknesses in the tools used will likely serve to exacerbate an already flawed strategy. Physicians likely use their "gut feelings" to judge a resident's overall performance. A better process could be conceived in which this subjectivity is acknowledged, contributing to more meaningful evaluation and feedback.

Gender Bias in Simulation-Based Assessments of Emergency Medicine Residents

Siegelman JN, Lall M, Lee L, Moran TP, Wallenstein J, Shah B. J Grad Med Educ. 2018 Aug;10(4): 411-415. doi: 10.4300/JGME-D-18-00059.1.

BACKGROUND:

Gender-related disparities persist in medicine and medical education. Prior work has found differences in medical education assessments based on gender.

OBJECTIVE:

We hypothesized that gender bias would be mitigated in a simulation-based assessment.

METHODS:

We conducted a retrospective cohort study of emergency medicine residents at a single, urban residency program. Beginning in spring 2013, residents participated in mandatory individual simulation assessments. Twelve simulated cases were included in this study. Rating forms mapped milestone language to specific observable behaviors. A Bayesian regression was used to evaluate the effect of resident and rater gender on assessment scores. Both 95% credible intervals (CrIs) and a Region of Practical Equivalence approach were used to evaluate the results.

RESULTS:

Participants included 48 faculty raters (25 men [52%]) and 102 residents (47 men [46%]). The difference in scores between male and female residents ($M = -0.58$, 95% CrI -3.31-2.11), and male and female raters ($M = 2.87$, 95% CrI -0.43-6.30) was small and 95% CrIs overlapped with 0. The 95% CrI for the interaction between resident and rater gender also overlapped with 0 ($M = 0.41$, 95% CrI -3.71- 4.23).

CONCLUSIONS:

In a scripted and controlled system of assessments, there were no differences in scores due to resident or rater gender.

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.

What Every Graduating Resident Needs to Know About Quality Improvement and Patient Safety: A Content Analysis of 26 Sets of ACGME Milestones

Lane-Fall M, Davis JJ, Clapp J, Myers JS, Riesenber LA. Acad Med. 2018 Jun;93(6):904-910. doi: 10.1097/ACM.0000000000002039.

PURPOSE:

Quality improvement (QI) and patient safety (PS) are broadly relevant to the practice of medicine, but specialty-specific milestones demonstrate variable expectations for trainee competency in QI/PS. The purpose of this study was to develop a unifying portrait of QI/PS expectations for graduating residents irrespective of specialty.

METHOD:

Milestones from 26 residency programs representing the 24 member boards of the American Board of Medical specialties were downloaded from the Accreditation Council for Graduate Medical Education (ACGME) website in 2015. A codebook was generated by in-depth reading of all milestone sets by two authors. Using a content analytic approach, milestones were then coded by a single author, with a 10% sample double-coded by another author. Descriptive statistics were used to characterize frequency counts.

RESULTS:

Of 612 total milestones, 249 (40.7%) made mention of QI/PS. A median 10 milestones per specialty (interquartile range, 5.25-11.75) mentioned QI/PS. There were 446 individual references to QI, 423 references to PS, and another 1,065 references to QI/PS-related concepts, including patient-centered care, cost-effective practice, documentation, equity, handoffs and care transitions, and teamwork. QI/PS references reflected expectations about both individual-level practice (531/869, 61.1%) and practice within a healthcare system (338/869, 38.9%). QI and PS references were linked to all six ACGME core competencies.

CONCLUSIONS:

Although there is variability in the emphasis placed on QI/PS across specialties, overall, QI/PS is reflected in more than 40% of residency milestones. Graduating residents in all specialties are expected to demonstrate competence in QI, PS, and multiple related concepts.

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.

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.

Development of Hospice and Palliative Medicine Knowledge and Skills for Emergency Medicine Residents: Using the Accreditation Council for Graduate Medical Education Milestone Framework

Shoenberger J, Lamba S, Goett R, DeSandre P, Aberger K, Bigelow S, Brandtman T, Chan GK, Zalenski R, Wang D, Rosenberg M, Jubanyik K. AEM Educ Train. 2018 Mar 22;2(2):130-145. doi: 10.1002/aet2.10088. eCollection 2018 Apr.

OBJECTIVES:

Emergency medicine (EM) physicians commonly care for patients with serious life-limiting illness. Hospice and palliative medicine (HPM) is a subspecialty pathway of EM. Although a subspecialty level of practice requires additional training, primary-level skills of HPM such as effective communication and symptom management are part of routine clinical care and expected of EM residents. However, unlike EM residency curricula in disciplines like trauma and ultrasound, there is no nationally defined HPM curriculum for EM resident training. An expert consensus group was convened with the aim of defining content areas and competencies for HPM primary-level practice in the ED setting. Our overall objective was to develop HPM milestones within a competency framework that is relevant to the practice of EM.

METHODS:

The American College of Emergency Physicians Palliative Medicine Section assembled a committee that included academic EM faculty, community EM physicians, EM residents, and nurses, all with interest and expertise in curricular design and palliative medicine.

RESULTS:

The committee peer reviewed and assessed HPM content for validity and importance to EM residency training. A topic list was developed with three domains: provider skill set, clinical recognition of HPM needs, and logistic understanding related to HPM in the ED. The group also developed milestones in HPM-EM to identify relevant knowledge, skills, and behaviors using the framework modeled after the Accreditation Council for Graduate Medical Education (ACGME) EM milestones. This framework was chosen to make the product as user-friendly and familiar as possible to facilitate use by EM educators.

CONCLUSIONS:

Educators in EM residency programs now have access to HPM content areas and milestones relevant to EM practice that can be used for curriculum development in EM residency programs. The HPM-EM skills/competencies presented herein are structured in a familiar milestone framework that is modeled after the widely accepted ACGME EM milestones.

Mapping the Balint Groups to the Accreditation Council for Graduate Medical Education Family Medicine Competencies

Lichtenstein A, Antoun J, Rule C, Knowlton K, Sternlieb J. *Int J Psychiatry Med*. 2018 Jan- Mar;53(1- 2):47-58. doi: 10.1177/0091217417745294. Epub 2017 Dec 13.

ABSTRACT:

Introduction Balint group discussions provide learning opportunities for many of the competencies and milestones put forward by the Accreditation Council for Graduate Medical Education. The current literature is mixed concerning the effect of Balint groups on communication skills and professionalism. Aim To map the content of the Balint discussion to the competencies and milestones put forward by the Accreditation Council for Graduate Medical Education.

METHODOLOGY:

A group who were both experts in Balint and members of the clinical competency committee of residency programs rated narratives that summarized Balint group discussions. Credentialed Leaders of the American Balint Society were invited via email to submit narratives (250 words) about Balint groups that they have led, or were leading, with residents.

RESULTS:

Only four narratives were submitted. Additional cases were recruited through literature review of published Balint discussion cases. A total of 25 cases were rated by the committee. There was agreement between three out of four raters on at least one core milestone in every case. The most frequent milestones were C1 (develops meaningful therapeutic relationships with patients and families), C2 (communicated effectively with patients, families, and public), Prof1 (completes a process of professionalization), and Prof3 (demonstrates humanism and cultural proficiency). Balint groups provided a learning opportunity for a subset of milestones in at least 36% of the cases.

CONCLUSION:

This pilot research suggests that Balint groups and the discussions of complex and challenging cases provide learning opportunities for multiple family medicine milestones, mainly communication skills and professionalism. Further research is needed to refine the methodology and the rating system.

Consensus Statement by the Congenital Cardiac Anesthesia Society: Milestones for the Pediatric Cardiac Anesthesia Fellowship

Nasr VG, Guzzetta NA, Miller-Hance WC, et al. *Anesthesia and Analgesia*. 2018;126(1):198- 207.
doi:10.1213/ANE.0000000000002482.

ABSTRACT:

Pediatric cardiac anesthesiology has evolved as a subspecialty of both pediatric and cardiac anesthesiology and is devoted to caring for individuals with congenital heart disease ranging in age from neonates to adults. Training in pediatric cardiac anesthesia is a second-year fellowship with variability in both training duration and content and is not accredited by the Accreditation Council on Graduate Medical Education. Consequently, in this article and based on the Accreditation Council on Graduate Medical Education Milestones Model, an expert panel of the Congenital Cardiac Anesthesia Society, a section of the Society of Pediatric Anesthesiology, defines 18 milestones as competency- based developmental outcomes for training in the pediatric cardiac anesthesia fellowship.

Trapped as a Group, Escape as a Team: Applying Gamification to Incorporate Teambuilding Skills Through an 'Escape Room' Experience

Zhang XC, Lee H, Rodriguez C, Rudner J, Chan TM, Papanagnou D. *Cureus*. 2018;10(3):e2256. doi:10.7759/cureus.2256. DOI 10.7759/cureus.2256

ABSTRACT:

Teamwork, a skill critical for quality patient care, is recognized as a core competency by the Accreditation Council for Graduate Medical Education (ACGME). To date, there is no consensus on how to effectively teach these skills in a forum that engages learners, immerses members in life-like activities, and builds both trust and rapport. Recreational 'Escape Rooms' have gained popularity in creating a life-like environment that rewards players for working together, solving puzzles, and completing successions of mindbending tasks in order to effectively 'escape the room' in the time allotted. In this regard, escape rooms share many parallels with the multitasking and teamwork that is essential for a successful emergency department (ED) shift. A pilot group of nine emergency medicine (EM) residents and one senior EM faculty member underwent a commercial escape room as part of a teambuilding exercise in January 2018. The escape room required participants to practice teamwork, communication, task delegation, and critical thinking to tackle waves of increasingly complex puzzles, ranging from hidden objects, physical object assembly (i.e., jigsaw puzzles), and symbol matching.

Activities required members to recognize and utilize the collective experiences, skills, knowledge base, and physical abilities of the group. After the game, players underwent a structured 'game-master' debriefing facilitated by an employee of the commercial escape room; this was followed by a post-event survey facilitated by a faculty member, which focused on participants' feelings, experiences, and problem-solving techniques. Escape rooms afford learners the opportunity to engage in an activity that rewards teamwork and effective leadership through experiences that directly link to specific ACGME milestones and educational learning theories. EM participants were engaged in the activity and felt that the escape room reproduced an environment analogous to the ED. The debriefing that followed the activity provided a satisfactory conclusion to the experience; but learners preferred a more organized debriefing format that provided them with constructive and specific feedback on their performance.

Aligning In-Service Training Examinations in Plastic Surgery and Orthopaedic Surgery with Competency-Based Education

Ganesh Kumar N, Benvenuti MA, Drolet BC. J Grad Med Educ. 2017 Oct;9(5):650-653. doi: 10.4300/JGME-D-17-00116.1.

BACKGROUND:

In-service training examinations (ITEs) are used to assess residents across specialties. However, it is not clear how they are integrated with the Accreditation Council for Graduate Medical Education Milestones and competencies.

OBJECTIVE:

This study explored the distribution of specialty-specific milestones and competencies in ITEs for plastic surgery and orthopaedic surgery.

METHODS:

In-service training examinations were publicly available for plastic surgery (PSITE) and orthopaedics (OITE). Questions on the PSITE for 2014-2016 and the OITE for 2013-2015 were mapped to the specialty-specific milestones and the 6 competencies.

RESULTS:

There was an uneven distribution of milestones and competencies in ITE questions. Nine of the 36 Plastic Surgery Milestones represented 52% (341 of 650) of questions, and 3 were not included in the ITE. Of 41 Orthopaedic Surgery Milestones, 7 represented 51% (201 of 394) of questions, and 5 had no representation on the ITE. Among the competencies, patient care was the most common (PSITE = 62% [403 of 650]; OITE = 59% [233 of 394]), followed by medical knowledge (PSITE = 34% [222 of 650]; OITE = 31% [124 of 394]). Distribution of the remaining competencies differed between the 2 specialties (PSITE = 4% [25 of 650]; OITE = 9% [37 of 394]).

CONCLUSIONS:

The ITEs tested slightly more than half of the milestones for the 2 specialties, and focused predominantly on patient care and medical knowledge competencies.

Gender Differences in Attending Physicians' Feedback to Residents: A Qualitative Analysis

Mueller AS, Jenkins TM, Osborne M, Dayal A, O'Connor DM, Arora VM. J Grad Med Educ. 2017 Oct;9(5):577-585. doi: 10.4300/JGME-D-17-00126.1.

BACKGROUND:

Prior research has shown a gender gap in the evaluations of emergency medicine (EM) residents' competency on the Accreditation Council for Graduate Medical Education (ACGME) milestones, yet the practical implications of this are not fully understood.

OBJECTIVE:

To better understand the gender gap in evaluations, we examined qualitative differences in the feedback that male and female residents received from attending physicians.

METHODS:

This study used a longitudinal qualitative content analysis of narrative comments by attending physicians during real-time direct observation milestone evaluations of residents. Comments were collected over 2 years from 1 ACGME-accredited EM training program.

RESULTS:

In total, 1317 direct observation evaluations with comments from 67 faculty members were collected for 47 postgraduate year 3 EM residents. Analysis of the comments revealed that the ideal EM resident possesses many stereotypically masculine traits. Additionally, examination of a subset of the residents (those with 15 or more comments, $n = 35$) showed that when male residents struggled, they received consistent feedback from different attending physicians regarding aspects of their performance that needed work. In contrast, when female residents struggled, they received discordant feedback from different attending physicians, particularly regarding issues of autonomy and assertiveness.

CONCLUSIONS:

Our study revealed qualitative differences in the kind of feedback that male and female EM residents received from attending physicians. The findings suggest that attending physicians should endeavor to provide male and female residents with consistent feedback and guard against gender bias in their perceptions of residents' capabilities.

Ways to Write a Milestone: Approaches to Operationalizing the Development of Competence in Graduate Medical Education

Leep Hunderfund AN, Reed DA, Starr SR, Havyer RD, Lang TR, Norby SM. Acad Med. 2017 Sep;92(9):1328-1334. doi: 10.1097/ACM.0000000000001660.

PURPOSE:

To identify approaches to operationalizing the development of competence in Accreditation Council for Graduate Medical Education (ACGME) milestones.

METHOD:

The authors reviewed all 25 "Milestone Project" documents available on the ACGME Web site on September 11, 2013, using an iterative process to identify approaches to operationalizing the development of competence in the milestones associated with each of 601 subcompetencies.

RESULTS:

Fifteen approaches were identified. Ten focused on attributes and activities of the learner, such as their ability to perform different, increasingly difficult tasks (304/601; 51%), perform a task better and faster (171/601; 45%), or perform a task more consistently (123/601; 20%). Two approaches focused on context, inferring competence from performing a task in increasingly difficult situations (236/601; 29%) or an expanding scope of engagement (169/601; 28%). Two used socially defined indicators of competence such as progression from "learning" to "teaching," "leading," or "role modeling" (271/601; 45%). One approach focused on the supervisor's role, inferring competence from a decreasing need for supervision or assistance (151/601; 25%). Multiple approaches were often combined within a single set of milestones (mean 3.9, SD 1.6).

CONCLUSIONS:

Initial ACGME milestones operationalize the development of competence in many ways. These findings offer insights into how physicians understand and assess the developmental progression of competence and an opportunity to consider how different approaches may affect the validity of milestone-based assessments. The results of this analysis can inform the work of educators developing or revising milestones, interpreting milestone data, or creating assessment tools to inform milestone-based performance measures.

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.

Critical Deficiency Ratings in Milestone Assessment: A Review and Case Study

Kinnear B, Bensman R, Held J, O'Toole J, Schauer D, Warm E. Acad Med. 2017 Jun;92(6):820-826. doi: 10.1097/ACM.0000000000001383.

PURPOSE:

The Accreditation Council for Graduate Medical Education (ACGME) requires programs to report learner progress using specialty-specific milestones. It is unclear how milestones can best identify critical deficiencies (CDs) in trainee performance. Specialties developed milestones independently of one another; not every specialty included CDs within milestones ratings. This study examined the proportion of ACGME milestone sets that include CD ratings, and describes one residency program's experiences using CD ratings in assessment.

METHOD:

The authors reviewed ACGME milestones for all 99 specialties in November 2015, determining which rating scales contained CDs. The authors also reviewed three years of data (July 2012-June 2015) from the University of Cincinnati Medical Center (UCMC) internal medicine residency assessment system based on observable practice activities mapped to ACGME milestones. Data were analyzed by postgraduate year, assessor type, rotation, academic year, and core competency. The Mantel-Haenszel chi-square test was used to test for changes over time.

RESULTS:

Specialties demonstrated heterogeneity in accounting for CDs in ACGME milestones, with 22% (22/99) of specialties having no language describing CDs in milestones assessment. Thirty-three percent (63/189) of UCMC internal medicine residents received at least one CD rating, with CDs accounting for 0.18% (668/364,728) of all assessment ratings. The authors identified CDs across multiple core competencies and rotations.

CONCLUSIONS:

Despite some specialties not accounting for CDs in milestone assessment, UCMC's experience demonstrates that a significant proportion of residents may be rated as having a CD during training. Identification of CDs may allow programs to develop remediation and improvement plans.

"The Actualized Neurosurgeon": A Proposed Model of Surgical Resident Development

Lipsman N, Khan O, Kulkarni AV. World Neurosurg. 2017 Mar; 99:381-386. doi: 10.1016/j.wneu.2016.12.039. Epub 2016 Dec 21.

BACKGROUND:

Modern neurosurgical training is both physically and emotionally demanding, posing significant challenges, new and old, to residents as well as programs attempting to train safe, competent surgeons. Models to describe resident development, such as the Accreditation Council for Graduate Medical Education competencies and milestones, address the acquisition of specific skills but largely ignore the stresses and pressures unique to each stage of resident training.

METHODS:

We propose an alternative model of resident development adapted from the developmental psychology literature.

RESULTS:

Our model identifies the challenges that must be met at each stage of junior, intermediate, and senior and chief residency, leading ultimately to an "actualized" neurosurgeon (i.e., one who has maximized his or her potential). Failure to overcome any 1 of these challenges can lead to specific long-lasting consequences, including regret, identity crisis, incompetence, and bitterness. In contrast, the actualized surgeon is one who has successfully acquired the virtues of hope, will, purpose, fidelity, productivity, leadership, competence, and wisdom. The actualized surgeon not only functions safely, confidently, and professionally, but also successfully navigates the challenges of residency and emerges from them having fulfilled his or her maximal potential.

CONCLUSIONS:

This developmental perspective provides an individualized description of healthy surgical development. Our model allows programs to identify the basis for residents who fail to progress, counsel residents during their training, and perhaps help identify resident candidates who are better prepared to meet the developmental challenges of residency training.

Implementation of a Needs-Based, Online Feedback Tool for Anesthesia Residents with Subsequent Mapping of the Feedback to the ACGME Milestones

Tanaka P, Bereiknyei Merrell S, Walker K, Zocca J, Scotto L, Bogetz AL, Macario A. *Anesth Analg*. 2017 Feb;124(2):627-635. doi:10.1213/ANE.0000000000001647.

BACKGROUND:

Optimizing feedback that residents receive from faculty is important for learning. The goals of this study were to (1) conduct focus groups of anesthesia residents to define what constitutes optimal feedback; (2) develop, test, and implement a web-based feedback tool; and (3) then map the contents of the written comments collected on the feedback tool to the Accreditation Council for Graduate Medical Education (ACGME) anesthesiology milestones.

METHODS:

All 72 anesthesia residents in the program were invited to participate in 1 of 5 focus groups scheduled over a 2-month period. Thirty-seven (51%) participated in the focus groups and completed a written survey on previous feedback experiences. On the basis of the focus group input, an initial online feedback tool was pilot-tested with 20 residents and 62 feedback sessions, and then a final feedback tool was deployed to the entire residency to facilitate the feedback process. The completed feedback written entries were mapped onto the 25 ACGME anesthesiology milestones.

RESULTS:

Focus groups revealed 3 major barriers to good feedback: (1) too late such as, for example, at the end of month-long clinical rotations, which was not useful because the feedback was delayed; (2) too general and not specific enough to immediately remedy behavior; and (3) too many in that the large number of evaluations that existed that were unhelpful such as those with unclear behavioral anchors compromised the overall feedback culture. Thirty residents (42% of 72 residents in the program) used the final online feedback tool with 121 feedback sessions with 61 attendings on 15 rotations at 3 hospital sites. The number of feedback tool uses per resident averaged 4.03 (standard deviation 5.08, median 2, range 1-21, 25th-75th % quartile 1-4). Feedback tool uses per faculty averaged 1.98 (standard deviation 3.2, median 1, range 1-25, 25th-75th % quartile 1-2). For the feedback question item "specific learning objective demonstrated well by the resident," this yielded 296 milestone-specific responses. The majority (71.3%) were related to the patient care competency, most commonly the anesthetic plan and conduct (35.8%) and airway management (11.1%) milestones; 10.5% were related to the interpersonal and communication skills competency, most commonly the milestones communication with other professionals (4.4%) or with patients and families (4.4%); and 8.4% were related to the practice-based learning and improvement competency, most commonly self-directed learning (6.1%). For the feedback tool item "specific learning objective that resident may improve," 67.0% were related to patient care, most commonly anesthetic plan and conduct (33.5%) followed by use/interpretation of monitoring and equipment (8.5%) and airway management (8.5%); 10.2% were related to practice-based learning and improvement, most commonly self-directed learning (6.8%); and 9.7% were related to the systems-based practice competency.

CONCLUSIONS:

Resident focus groups recommended that feedback be timely and specific and be structured around a tool. A customized online feedback tool was developed and implemented. Mapping of the free-text feedback comments may assist in assessing milestones. Use of the feedback tool was lower than expected, which may indicate that it is just 1 of many implementation steps required for behavioral and culture change to support a learning environment with frequent and useful feedback.

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.

Emergency Medicine Resident Assessment of the Emergency Ultrasound Milestones and Current Training Recommendations

Stolz LA, Stolz U, Fields JM, et al. Emergency Medicine Resident Assessment of the Emergency Ultrasound Milestones and Current Training Recommendations. *Academic Emergency Medicine*. 2017; (3):353. doi:10.1111/acem.13113.

OBJECTIVES

Emergency ultrasound (EUS) has been recognized as integral to the training and practice of emergency medicine (EM). The Council of Emergency Medicine Residency-Academy of Emergency Ultrasound (CORD-AEUS) consensus document provides guidelines for resident assessment and progression. The Accredited Council for Graduate Medical Education (ACGME) has adopted the EM Milestones for assessment of residents' progress during their residency training, which includes demonstration of procedural competency in bedside ultrasound. The objective of this study was to assess EM residents' use of ultrasound and perceptions of the proposed ultrasound milestones and guidelines for assessment.

METHODS

This study is a prospective stratified cluster sample survey of all U.S. EM residency programs. Programs were stratified based on their geographic location (Northeast, South, Midwest, West), presence/absence of ultrasound fellowship program, and size of residency with programs sampled randomly from each stratum. The survey was reviewed by experts in the field and pilot tested on EM residents. Summary statistics and 95% confidence intervals account for the survey design, with sampling weights equal to the inverse of the probability of selection, and represent national estimates of all EM residents.

RESULTS

There were 539 participants from 18 residency programs with an overall survey response rate of 85.1%. EM residents considered several applications to be core applications that were not considered core applications by CORD-AEUS (quantitative bladder volume, diagnosis of joint effusion, interstitial lung fluid, peritonsillar abscess, fetal presentation, and gestational age estimation). Of several core and advanced applications, the Focused Assessment with Sonography in Trauma examination, vascular access, diagnosis of pericardial effusion, and cardiac standstill were considered the most likely to be used in future clinical practice. Residents responded that procedural guidance would be more crucial to their future clinical practice than resuscitative or diagnostic ultrasound. They felt that an average of 325 (301-350) ultrasound examinations would be required to be proficient, but felt that number of examinations poorly represented their competency. They reported high levels of concern about medicolegal liability while using EUS. Eighty-nine percent of residents agreed that EUS is necessary for the practice of EM.

CONCLUSIONS

EM resident physicians' opinion of what basic and advanced skills they are likely to utilize in their future clinical practice differs from what has been set forth by various groups of experts. Their opinion of how many ultrasound examinations should be required for competency is higher than what is currently expected during training.

Goal-directed Focused Ultrasound Milestones Revised: A Multiorganizational Consensus

Nelson M, Abdi A, Adhikari S, Boniface M, Bramante RM, Egan DJ, Matthew Fields J, Leo MM, Liteplo AS, Liu R, Nomura JT, Pigott DC, Raio CC, Ruskis J, Strony R, Thom C, Lewiss RE. Acad Emerg Med. 2016 Nov;23(11):1274-1279. doi: 10.1111/acem.13069. Epub 2016 Oct 31.

ABSTRACT:

In 2012 the Accreditation Council for Graduate Medical Education and the American Board of Emergency Medicine released the emergency medicine milestones. The Patient Care 12 (PC12) subcompetency delineates staged and progressive accomplishment in emergency ultrasound. While valuable as an initial framework for ultrasound resident education, there are limitations to PC12. This consensus paper provides a revised description of criteria to define the subcompetency. A multiorganizational task force was formed between the American College of Emergency Physicians Ultrasound Section, the Council of Emergency Medicine Residency Directors, and the Academy of Emergency Ultrasound of the Society for Academic Emergency Medicine. Representatives from each organization created this consensus document and revision.

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, Ibrahim 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.

A Survey of Ultrasound Milestone Incorporation into Emergency Medicine Training Programs

Smalley CM, Dorey A, Thiessen M, Kendall JL. J Ultrasound Med. 2016 Jul;35(7):1517-21. doi: 10.7863/ultra.15.09012. Epub 2016 Jun 7.

OBJECTIVES:

With the introduction of the Emergency Medicine Milestone Project in 2013, residencies now assess emergency ultrasound (US) skills at regular intervals. However, it is unclear how programs are implementing the emergency US milestones and assessing competency. With the use of the milestone tool, a survey was distributed to emergency US educators to determine when programs are providing emergency US education, when residents are expected to attain competency, and whether the milestones reflect their expectations of trainees.

METHODS:

We conducted a prospective cross-sectional survey study distributed electronically to designated emergency US experts at 169 programs. Participants were queried on education and competency evaluation within the context of the milestones by designating a postgraduate year when the 5 milestone levels were taught and competency was expected. Survey findings were reported as percentages of total respondents from descriptive statistics.

RESULTS:

Responses were received from 53% of programs, and 99% were familiar with the milestones. Most programs provide level 1 (88%) and 2 (85%) instruction during postgraduate year 1. Most programs expect level 1 competency before residency (61%) and expect mastery of level 2 by the end of postgraduate year 1 (60%). Sixty-two percent believe the milestones do not accurately reflect their expectations, citing insufficient minimum scan numbers, lack of specificity, and unattainable level 5 requirements.

CONCLUSIONS:

There is substantial variability in the frequency and methods of competency evaluation using the emergency US milestones. However, most responders agree that residents should obtain level 2 competency by postgraduate year 1. Variation exists regarding what year and what skills define level 3 or greater competency.

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.

Milestones for the Final Mile: Interspecialty Distinctions in Primary Palliative Care Skills Training

Harris JA, Herrel LA, Healy MA, Wancata LM, Perumalswami CR. J Pain Symptom Manage. 2016 Sep;52 (3):345-352.e5. doi: 10.1016/j.jpainsymman.2016.03.007. Epub 2016 Jun 1.

CONTEXT:

Primary palliative care (PPC) skills are useful in a wide variety of medical and surgical specialties, and the expectations of PPC skill training are unknown across graduate medical education.

OBJECTIVES:

We characterized the variation and quality of PPC skills in residency outcomes-based Accreditation Council for Graduate Medical Education (ACGME) milestones.

METHODS:

We performed a content analysis with structured implicit review of 2015 ACGME milestone documents from 14 medical and surgical specialties chosen for their exposure to clinical situations requiring PPC. For each specialty milestone document, we characterized the variation and quality of PPC skills in residency outcomes-based ACGME milestones.

RESULTS:

We identified 959 occurrences of 29 palliative search terms within 14 specialty milestone documents. Within these milestone documents, implicit review characterized 104 milestones with direct saliency to PPC skills and 196 milestones with indirect saliency. Initial interrater agreement of the saliency rating among the primary reviewers was 89%. Specialty milestone documents varied widely in their incorporation of PPC skills within milestone documents. PPC milestones were most commonly found in milestone documents for Anesthesiology, Pediatrics, Urology, and Physical Medicine and Rehabilitation. PPC-relevant milestones were most commonly found in the Interpersonal and Communication Skills core competency with 108 (36%) relevant milestones classified under this core competency.

CONCLUSIONS:

Future revisions of specialty-specific ACGME milestone documents should focus on currently underrepresented, but important PPC skills.

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's New in 10 Years? A Revised Cardiothoracic Curriculum for Diagnostic Radiology Residency with Goals and Objectives Related to General Competencies

Nguyen ET, Ackman JB, Rajiah P, Little B, Wu C, Bueno JM, Gilman MD, Christensen JD, Madan R, Laroia AT, Lee C, Kanne JP, Collins J. *Acad Radiol.* 2016 Jul;23(7):911-8. doi: 10.1016/j.acra.2016.01.022. Epub 2016 May 27.

ABSTRACT:

This is a cardiothoracic curriculum document for radiology residents meant to serve not only as a study guide for radiology residents but also as a teaching and curriculum reference for radiology educators and radiology residency program directors. This document represents a revision of a cardiothoracic radiology resident curriculum that was published 10 years ago in *Academic Radiology*. The sections that have been significantly revised, expanded, or added are (1) lung cancer screening, (2) lung cancer genomic profiling, (3) lung adenocarcinoma revised nomenclature, (4) lung biopsy technique, (5) nonvascular thoracic magnetic resonance, (6) updates to the idiopathic interstitial pneumonias, (7) cardiac computed tomography updates, (8) cardiac magnetic resonance updates, and (9) new and emerging techniques in cardiothoracic imaging. This curriculum was written and endorsed by the Education Committee of the Society of Thoracic Radiology. This curriculum operates in conjunction with the Accreditation Council for Graduate Medical Education (ACGME) milestones project that serves as a framework for semiannual evaluation of resident physicians as they progress through their training in an ACGME-accredited residency or fellowship programs. This cardiothoracic curriculum document is meant to serve not only as a more detailed guide for radiology trainees, educators, and program directors but also complementary to and guided by the ACGME milestones.

Mapping Direct Observations From Objective Structured Clinical Examinations to the Milestones Across Specialties

Baker-Genaw K, Kokas MS, Ahsan SF, Darnley-Fisch D, Drake S, Goyal N, Inamdar K, Moutzouros V, Prabhakar D, Rolland L, Sangha R, Shreve M, Woodward A. *J Grad Med Educ.* 2016 Jul;8(3):429-34. doi: 10.4300/JGME-D-15-00385.1.

BACKGROUND:

Little is known about residents' performance on the milestones at the institutional level. Our institution formed a work group to explore this using an institutional-level curriculum and residents' evaluation of the milestones.

OBJECTIVE:

We assessed whether beginner-level milestones for interpersonal and communication skills (ICS) related to observable behaviors in ICS-focused objective structured clinical examinations (OSCEs) for postgraduate year (PGY) 1 residents across specialties.

METHODS:

The work group compared ICS subcompetencies across 12 programs to identify common beginner-level physician-patient communication milestones. The selected ICS milestone sets were compared for common language with the ICS-OSCE assessment tool-the Kalamazoo Essential Elements of Communication Checklist-Adapted (KEECC-A). To assess whether OSCE scores related to ICS milestone scores, all PGY-1 residents from programs that were part of Next Accreditation System Phase 1 were identified; their OSCE scores from July 2013 to June 2014 and ICS subcompetency scores from December 2014 were compared.

RESULTS:

The milestones for 10 specialties and the transitional year had at least 1 ICS subcompetency that related to physician-patient communication. The language of the ICS beginner-level milestones appears similar to behaviors outlined in the KEECC-A. All 60 residents with complete data received at least a beginner-level ICS subcompetency score and at least a satisfactory score on all 3 OSCEs.

CONCLUSIONS:

The ICS-OSCE scores for PGY-1 residents appear to relate to beginner-level milestones for physician-patient communication across multiple specialties.

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.

Direct Observation Assessment of Milestones: Problems with Reliability

Schott M, Kedia R, Promes SB, Swoboda T, O'Rourke K, Green W, Liu R, Stansfield B, Santen SA. West J Emerg Med. 2015 Nov;16(6):871-6. doi: 10.5811/westjem.2015.9.27270. Epub 2015 Oct 22.

INTRODUCTION:

Emergency medicine (EM) milestones are used to assess residents' progress. While some milestone validity evidence exists, there is a lack of standardized tools available to reliably assess residents. Inherent to this is a concern that we may not be truly measuring what we intend to assess. The purpose of this study was to design a direct observation milestone assessment instrument supported by validity and reliability evidence. In addition, such a tool would further lend validity evidence to the EM milestones by demonstrating their accurate measurement.

METHODS:

This was a multi-center, prospective, observational validity study conducted at eight institutions. The Critical Care Direct Observation Tool (CDOT) was created to assess EM residents during resuscitations. This tool was designed using a modified Delphi method focused on content, response process, and internal structure validity. Paying special attention to content validity, the CDOT was developed by an expert panel, maintaining the use of the EM milestone wording. We built response process and internal consistency by piloting and revising the instrument. Raters were faculty who routinely assess residents on the milestones. A brief training video on utilization of the instrument was completed by all. Raters used the CDOT to assess simulated videos of three residents at different stages of training in a critical care scenario. We measured reliability using Fleiss' kappa and interclass correlations.

RESULTS:

Two versions of the CDOT were used: one used the milestone levels as global rating scales with anchors, and the second reflected a current trend of a checklist response system. Although the raters who used the CDOT routinely rate residents in their practice, they did not score the residents' performances in the videos comparably, which led to poor reliability. The Fleiss' kappa of each of the items measured on both versions of the CDOT was near zero.

CONCLUSION:

The validity and reliability of the current EM milestone assessment tools have yet to be determined. This study is a rigorous attempt to collect validity evidence in the development of a direct observation assessment instrument. However, despite strict attention to validity evidence, inter-rater reliability was low. The potential sources of reducible variance include rater- and instrument-based error. Based on this study, there may be concerns for the reliability of other EM milestone assessment tools that are currently in use.

Reviewing Residents' Competence: A Qualitative Study of the Role of Clinical Competency Committees in Performance Assessment

Hauer KE, Chesluk B, Iobst W, Holmboe E, Baron RB, Boscardin CK, Cate OT, O'Sullivan PS. Acad Med. 2015 Aug;90(8):1084-92. doi: 10.1097/ACM.0000000000000736.

PURPOSE:

Clinical competency committees (CCCs) are now required in graduate medical education. This study examined how residency programs understand and operationalize this mandate for resident performance review.

METHOD:

In 2013, the investigators conducted semi-structured interviews with 34 residency program directors at five public institutions in California, asking about each institution's CCCs and resident performance review processes. They used conventional content analysis to identify major themes from the verbatim interview transcripts.

RESULTS:

The purpose of resident performance review at all institutions was oriented toward one of two paradigms: a problem identification model, which predominated; or a developmental model. The problem identification model, which focused on identifying and addressing performance concerns, used performance data such as red-flag alerts and informal information shared with program directors to identify struggling residents. In the developmental model, the timely acquisition and synthesis of data to inform each resident's developmental trajectory was challenging. Participants highly valued CCC members' expertise as educators to corroborate the identification of struggling residents and to enhance credibility of the committee's outcomes. Training in applying the milestones to the CCC's work was minimal. Participants were highly committed to performance review and perceived the current process as adequate for struggling residents but potentially not for others.

CONCLUSIONS:

Institutions orient resident performance review toward problem identification; a developmental approach is uncommon. Clarifying the purpose of resident performance review and employing efficient information systems that synthesize performance data and engage residents and faculty in purposeful feedback discussions could enable the meaningful implementation of milestones-based assessment.

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.

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.

CORR® Curriculum—Orthopaedic Education: Operative Assessment and the ACGME Milestones: Time for Change

Van Heest AE, Dougherty PJ. Clin Orthop Relat Res. 2015 Mar;473(3):775-8. doi: 10.1007/s11999-014-4131-7. Epub 2015 Jan 11.

ABSTRACT:

The article offers information on the implementation of the Milestones program outlined by the Accreditation Council on Graduate Medical Education (ACGME) which provides a detailed framework for determining residency knowledge within specific core competencies in Orthopaedic medical education. Topics discussed include a residency program initiated by surgeon, William S. Halsted, development of formal orthopaedic postgraduate education, and expansion of the education after World War II.

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.

Survey of Developmental Milestones in Internal Medicine among Residents and Faculty

Marhatta A, Messina D, Petrini JR, Lecaj A, Ahmadi R. *Conn Med*. 2014 May;78(5):293-8.

OBJECTIVES:

The published Accreditation Council for Graduate Medical Education (ACGME) milestones represent a novel method of evaluation of trainees in graduate medical education. We surveyed a group of teaching faculty and residents, regarding the new ACGME milestones project. We obtained their input on the expected timeline for the developmental milestones and compared their responses to the ACGME recommendations.

METHODS:

A 42-item survey questionnaire, derived from the original 142 item publication, was completed by 26 internal medicine teaching faculty and 34 internal medicine residents.

RESULTS:

We found statistically significant differences in the responses given by residents and faculty compared to those in the standard recommendations. The differences were more pronounced with the residents than with the faculty.

CONCLUSIONS:

The results of our survey showed significantly different responses as compared to the standard recommended timelines. Since this is a novel evaluation process, substantial faculty development and resident education regarding the process can help improve its implementation. Future studies should focus on how learners might better understand and refine the milestone evaluation process.

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.

The "Zing Factor" – How Do Faculty Describe the Best Pediatrics Residents?

Rosenbluth G, O'Brien B, Asher EM, Cho CS. J Grad Med Educ. 2014 Mar;6(1):106-11. doi: 10.4300/JGME-D-13-00146.1.

BACKGROUND:

Faculty in graduate medical education programs may not have uniform approaches to differentiating the quality of residents, and reviews of evaluations suggest that faculty use different standards when assessing residents. Standards for assessing residents also do not consistently map to items on evaluation forms. One way to improve assessment is to reach consensus on the traits and behaviors that are (or should be) present in the best residents.

METHODS:

A trained interviewer conducted semistructured interviews with faculty affiliated with 2 pediatrics residency programs until content saturation was achieved. Interviewees were asked to describe specific traits present in residents they identify as the best. Interviews were recorded and transcribed. We used an iterative, inductive approach to generate a coding scheme and identify common themes.

RESULTS:

From 23 interviews, we identified 7 thematic categories of traits and behaviors: personality, energy, professionalism, team behaviors, self-improvement behaviors, patient-interaction behaviors, and medical knowledge and clinical skills (including a subcategory, knowledge integration). Most faculty interviewees focused on traits like passion, enthusiasm, maturity, and reliability. Examination score or intelligence was mentioned less frequently than traits and behaviors categorized under personality and professionalism.

CONCLUSIONS:

Faculty identified many traits and behaviors in the residents they define as the best. The thematic categories had incomplete overlap with Accreditation Council for Graduate Medical Education (ACGME) and CanMEDS competencies. This research highlights the ongoing need to review our assessment strategies, and may have implications for the ACGME Milestone Project.

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 Emergency Medicine Milestones: A Validation Study

Korte RC, Beeson MS, Russ CM, Carter WA; Emergency Medicine Milestones Working Group, Reisdorff EJ. *Acad Emerg Med.* 2013 Jul;20(7):730-5. doi: 10.1111/acem.12166.

OBJECTIVES:

The Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Medical Specialties sought to define milestones for skill and knowledge acquisition during residency training. Milestones are significant objective observable events. The milestones are listed within a structure that is derived from the ACGME general competencies. Major groups of milestones are called "subcompetencies." The original 24 subcompetencies containing 255 milestones for emergency medicine (EM) were developed through a multiorganizational group representing most EM stakeholder groups. To assure that the milestones reflected EM resident progress throughout training, the EM Milestones Working Group (EM MWG) sought to validate the individual milestones.

METHODS:

A computer-based survey was sent to all EM residency programs. The survey period began on April 30, 2012, and concluded on May 15, 2012. Respondents were asked to assign each milestone to a specific level of skill or knowledge acquisition. These levels ranged from a beginning resident to an accomplished clinician. There were two different forms that divided the milestones into two groups of 12 subcompetencies each. Surveys were randomly assigned to programs.

RESULTS:

There were five respondents (the program director and four key faculty) requested from each of the 159 residences. There were responses from 96 programs (60.4%). Of the 795 survey recipients, 28 were excluded due to prior exposure to the EM milestones. Of the remaining 767 potential respondents, 281 completed the survey (36.6%) within a 16-day period. Based on the survey results, the working group adjusted the milestones in the following ways: one entire subcompetency (teaching) was eliminated, six new milestones were created, 34 milestones were eliminated, 26 milestones were reassigned to a lower level score, and 20 were reassigned to a higher level. Nineteen milestones were edited to provide greater clarity. The final result was 227 discrete milestones among 23 subcompetencies.

CONCLUSIONS:

The EM milestones were validated through a milestone assignment process using a computer-based survey completed by program directors and key faculty. Milestones were revised in accordance with the results to better align assignment within each performance level.

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 6 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 workgroups 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 workgroups 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.

The Pediatrics Milestones: Initial Evidence for their Use as Learning Road Maps for Residents

Schumacher DJ, Lewis KO, Burke AE, Smith ML, Schumacher JB, Pitman MA, Ludwig S, Hicks PJ, Guralnick S, Englander R, Benson B, Carraccio C. Acad Pediatr. 2013 Jan-Feb;13(1):40-7. doi: 10.1016/j.acap.2012.09.003. Epub 2012 Nov 17.

OBJECTIVE:

As the next step in competency-based medical education, the Pediatrics Milestone Project seeks to provide a learner-centered approach to training and assessment. To help accomplish this goal, this study sought to determine how pediatric residents understand, interpret, and respond to the Pediatrics Milestones.

METHODS:

Cognitive interviews with 48 pediatric residents from all training levels at 2 training programs were conducted. Each participant reviewed one Pediatrics Milestone document (PMD). Eight total Pediatrics Milestones, chosen for their range of complexity, length, competency domain, and primary author, were included in this study. Six residents, 2 from each year of residency training, reviewed each PMD. Interviews were transcribed and coded using inductive methods, and codes were grouped into themes that emerged.

RESULTS:

Four major themes emerged through coding and analysis: 1) the participants' degree of understanding of the PMDs is sufficient, often deep; 2) the etiology of participants' understanding is rooted in their experiences; 3) there are qualities of the PMD that may contribute to or detract from understanding; and 4) participants apply their understanding by noting the PMD describes a developmental progression that can provide a road map for learning. Additionally, we learned that residents are generally comfortable being placed in the middle of a series of developmental milestones. Two minor themes focusing on interest and practicality were also identified.

CONCLUSIONS:

This study provides initial evidence for the Pediatrics Milestones as learner-centered documents that can be used for orientation, education, formative feedback, and, ultimately, assessment.

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.

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.