Using Milestones to Guide Curriculum

Readers' Guide

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

Background:

The Milestones can be used as a guide for resident and fellowship academic growth and career development and can serve as a roadmap for career advancement for clinicians. The Milestones serve as a structured assessment framework for the six Core Competencies, and they are just one of the many tools available to both learners and faculty members to track and guide the learner's progress throughout the residency or fellowship curriculum.

The Milestones should not be regarded as a curriculum on their own; instead, they should serve as a framework to facilitate a comprehensive assessment of the curriculum, highlighting both its strengths and weaknesses. During the assessment of Milestones, it is possible to identify gaps in teaching, assessment, or both. By mapping out the methods used to teach each sub-competency and the tools used to evaluate performance, it may become apparent that there is insufficient data available to assess an ACGME Milestone accurately. Adjustments to the curriculum or evaluation methods can then be made accordingly to address these gaps.

What's in the literature?

The bibliography includes examples of how the Milestones can be leveraged to help strengthen overall curriculum development, how to align a program's curriculum with ACGME Milestones, how to introduce a milestones-based curriculum to medical students prior to PGY-1, how to use a Milestones-based feedback tool to assess simulations, and how to Introduce a curriculum model that aims to equip learners with the skills to fulfill ACGME Milestones. Other examples include:

- Participating in activities that incentivize teamwork and leadership by providing experiences that are closely tied to specific ACGME milestones
- Developing a Global Health Milestones Tool for Learners
- How Milestones provide a learner centered approach to training and assessment

Educational Curriculum for Peripheral Nerve Stimulation Developed by the North American Neuromodulation Society

Kalia H, Abd-Elsayed A, Malinowski M, Burkey A, Abdallah RT, Sivanesan E, Malik T, Tolba R, Eshraghi Y, Ferguson K, Schnur M, Raslan A, Guirguis M, Russo M, Slavin KV. Neuromodulation. 2022 Dec 14:S1094-7159(22)01361-7. doi: 10.1016/j.neurom.2022.09.015. Epub ahead of print. PMID: 36526547.

BACKGROUND:
Peripheral nerve stimulation (PNS) is an effective neuromodulation therapy for chronic neuropathic and nociceptive pain. Although the total number of PNS and learning of this therapy. The goal of the North American Neuromodulation Society (NANS) education committee is to develop a series of competency-based curriculums for neuromodulation therapies. The PNS curriculum is the latest part of such series, following the curriculums for spinal cord stimulation and intrathecal drug delivery system.

METHODS:
A multidisciplinary task force (anesthesiology, physical medicine and rehabilitation, neurosurgery, preventive medicine and public health, and neurology) was created by the educational committee of NANS to develop a PNS curriculum in accordance with the Accreditation Council for Graduate Medical Education (ACGME) milestones. The curriculum was created based on the best available evidence and expert knowledge (from our task force members) of available PNS systems. The final PNS curriculum was approved by the NANS board.

RESULTS:
A PNS curriculum was developed by the task force. Milestones included professionalism, practice-based learning, interpersonal communication, medical knowledge, systems-based practice, procedural skills, and patient care. Each milestone was defined into three categories: early learner, advanced learner, and practitioner.

CONCLUSIONS:
This manuscript provides a PNS training curriculum developed by a multidisciplinary task force of the NANS educational committee in accordance with the milestones described by ACGME for basic learners, advanced learners, and practitioners. This curriculum will help provide a structured training and evaluation process for obtaining proficiency in PNS treatment(s).

Beyond opioid prescribing: Evaluation of a substance use disorder curriculum for OBGYN residents

Martin CE, Thakkar B, Cox L, Johnson E, Jones HE, Connolly A. PLoS One. 2022 Sep 15;17(9):e0274563. doi: 10.1371/journal.pone.0274563. PMID: 36107914; PMCID: PMC9477269.

OBJECTIVE:
Amidst the current opioid crisis, there is a need for better integration of substance use disorder screening and treatment across specialties. However, there is no consensus regarding how to best instruct OBGYN trainees in the clinical skills related to opioid and other substance use disorders (SUD). Study objectives were (1) to assess the effectiveness a SUD curriculum to improve self-reported competence among OBGYN residents and (2) to explore its effectiveness to improve attending evaluations of residents' clinical skills as well as its feasibility and acceptability from the resident perspective.

METHODS:
A pilot 3-session curriculum was developed and adapted to SUD screening and treatment which included readings, didactics, and supervised outpatient clinical experiences for OBGYN post-graduate year 1 (PGY-1) residents rotating through an integrated OBGYN-SUD clinic. Eighteen residents completed pre and post clinical skills self-assessments (SUD screening, counseling, referring, Motivational Interviewing) using an adapted Zwisch Rating Scale (range 1-5). Scores were compared between time points using paired t-tests. Sub-samples also (a) were evaluated by the attending on three relevant Accreditation Council for Graduate Medical Education Milestones (ACGME) milestone sets using the web-based feedback program, myTIPreport (n = 10) and (b) completed a qualitative interview (n = 4).

RESULTS:
All PGY-1s (18/18) across three academic years completed the 3-session SUD curriculum. Clinical skill self-assessments improved significantly in all areas [SUD Screening (2.44 (0.98) vs 3.56 (0.62), p = <0.01); Counseling (1.81 (0.71) vs 3.56 (0.51), p = < .01; Referring (2.03 (0.74) vs 3.17 (0.71), p = < .01; Motivational Interviewing (1.94 (1.06) vs 3.33 (0.69), p = < .01)]. Milestone set levels assigned by attending evaluations (n = 10) also improved. Qualitative data (n = 4) revealed high acceptability; all curriculum components were viewed positively, and feedback was provided (e.g., desire for more patient exposures).

CONCLUSION:
A pilot SUD curriculum tailored for OBGYN PGY-1 residents that goes beyond opioid prescribing to encompass SUD management is feasible, acceptable and likely effective at improving SUD core clinical skills.

Targeting the Future: Developing a Training Curriculum for Robotic Assisted Neurosurgery

Mallela AN, Beiriger J, Gersey ZC, Shariff RK, Gonzalez SM, Agarwal N, González-Martínez JA, Abou-Al-Shaar H. World Neurosurg. 2022 Aug 25:S1878-8750(22)01186-X. doi: 10.1016/j.wneu.2022.08.076. Epub ahead of print. PMID: 36030012.

OBJECTIVE:
Technological advances have significantly fostered the use of robotics in neurosurgery. Due to their novelty, there is a need to develop training methods within neurosurgical residency programs that provide trainees the skills to utilize these systems in their future practices safely and effectively.

METHODS:
We describe a detailed curriculum for trainees with significant responsibilities in the operating room, as well as hands-on and theoretical didactics. The curriculum for robot-assisted stereotactic electroencephalography (SEEG) and deep brain stimulation (DBS) electrode implantation technique and assessment tool has been designed based on Accreditation Council for Graduate Medical Education's (ACGME's) milestone requirement for surgical treatment of epilepsy and movement disorders. Residents were surveyed to assess their use of robotics in their surgical training.

RESULTS:
Since 2019, more than 100 patients have undergone robot-assisted SEEG and DBS depth electrode implantations at our institution. Residents and fellows were involved in all aspects of surgical planning and execution and were encouraged to take an active role during procedures. Didactic sessions led by experienced faculty are emphasized as important learning tools prior to hands-on experience in the operating room. The results of the survey show that residents receive more training intraoperatively as compared to training sessions, yet trainees would benefit from more instruction on informative cadaveric simulation sessions.

CONCLUSIONS:
Our curriculum was developed to become a structured tool for assessment of robotic education in neurosurgical training. This curriculum based on ACGME milestone requirements serve as a template for resident and fellow education in robotics in neurosurgery.

Medical Residency Milestones: Competencies in Informatics, Library, and Evidence-Based Practice

Rhue DJ, Eldredge JD. Med Ref Serv Q. 2022 Jul-Sep;41(3):236-247. doi: 10.1080/02763869.2022.2093545. PMID: 35980629.

ABSTRACT

The Accreditation Council for Graduate Medical Education (ACGME) sets standards known as Milestones and monitors the progress of medical residents as they advance toward medical practice in their specialties. Health sciences librarians need to train medical residents in certain competency areas to help reach the Milestone standards. This project analyzed the Milestones related to informatics, library, and evidence-based practice (EBP) skills to identify core and optional library-related curricular elements that can be integrated into different medical specialty residencies. The authors collected key competency documents from ACGME and from those specialties representing 2% or more of the residencies in the United States. Then, they compared and contrasted those Milestones related to informatics, library, and EBP competency skills. Most relevant Milestones were categorized under the fifth broad ACGME competency area of "Practice Based Learning and Improvement." The Milestones followed developmental patterns, reflecting residents' increased sophistication in meeting these competencies as they advanced in their specialties. The curriculum was designed to meet the residents' learning needs at each progressive Milestone.

Breast Imaging Boot Camp Meets Milestones 2.0: A Match Made in Clinic

Jordan SG, Lee SS, Rivers LM, Schwartz CJ, Benefield T, Beck Dallaghan GL. Acad Radiol. 2022 Jan;29 Suppl 1:S246-S254. Doi: 10.1016/j.acra.2020.12.022. Epub 2021 Jan 21. PMID: 33487540.

RATIONALE:
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 training, but also meet accreditation standards. With the breadth of material to cover during training, carefully orchestrated educational experiences must be planned. This manuscript reports a breast imaging boot camp curriculum with longitudinal outcomes, highlighting the boot camp's pedagogy and adaptability for residencies to meet the challenges of the Accreditation Council for Graduate Medical Education (ACGME) Diagnostic Radiology Milestones Second Revision.

METHODS:
Breast block curriculum analysis, faculty leader preparation, and evaluation of all objective external benchmarks were undertaken commencing in 2012 and continuing through 2019. Specific curriculum changes include fundamental didactic lectures and self-study education modules, hands-on simulation activities, and team-building time. Upon publication of The Diagnostic Radiology Milestones Second Revision December 2019, all competencies were assessed in the context of the boot camp resident educational experiences.

RESULTS:
Following curriculum implementation, resident anonymous evaluation scores of the breast block, resident in-training examination scores, American Board of Radiology Core examination scores, and radiology residency educational website analytics all increased immediately and significantly. The curriculum meets twenty-four Diagnostic Milestones per participating resident when mapped against the newly implemented ACGME requirements.

CONCLUSIONS:
Breast imaging boot camp is a successful innovative curriculum, readily meeting our learners' needs in all objective benchmarks. Further, the adaptable model has the potential to play important roles in assisting residencies to meet the challenges of the ACGME Diagnostic Radiology Milestones Second Revision July 1, 2020 implementation date.

Development of Osteopathic Neuromusculoskeletal Medicine (ONMM) residency curriculum guidelines to meet Accreditation Council for Graduate Medical Education (ACGME) milestones

Balyakina ES, Hansen MM, Mason D. J Osteopath Med. 2022 Jan 24;122(4):175-185. doi: 10.1515/jom-2021-0122. PMID: 35106986.

BACKGROUND:
A memorandum of understanding was reached between the Accreditation Council for Graduate Medical Education (ACGME), the American Osteopathic Association (AOA), and the American Association of Colleges of Osteopathic Medicine (AACOM) in 2014 outlining the course for a single accreditation system for graduate medical education. This process was completed in 2020 and has included the transition of AOA-accredited neuromusculoskeletal and Osteopathic Manipulative Medicine (OMM) programs into programs now termed "Osteopathic Neuromusculoskeletal Medicine" (ONMM) under the single accreditation system. Progress through ONMM residency is evaluated on the basis of 15 ACGME milestones that encompass six core competencies. However, there are no curricular guidelines to help guide the achievement of these milestones.

OBJECTIVES:
The primary purpose of this study was to develop a proposed structure and content for an ONMM residency curriculum that is based on (1) the alignment of residency curriculum with ACGME milestones in one ACGME-accredited ONMM residency program, and (2) the perceived needs of residents and faculty for an ONMM residency curriculum.

METHODS:
A mixed-methods exploratory sequential approach with embedded design was utilized. Qualitative analysis of didactics curriculum content for the past 2 years was coded according to themes identified in the residency curriculum content, which were further coded according to ACGME milestones. Curriculum topics identified in qualitative analysis were utilized to create a questionnaire that was administered to residents and faculty (n=24) in the ONMM residency program to examine the perceived importance of each curriculum topic based on a five-point Likert scale. Open-ended questions were embedded in the questionnaire that asked how faculty and residents define ONMM and what they believe should be the purpose of an ONMM residency curriculum.

RESULTS:
Five themes were identified in qualitative analysis of curriculum: (1) OMM laboratory topics; (2) faculty-led activities and lecture topics; (3) resident-led activities and lecture topics; (4) research; and (5) training courses and volunteer activities. The most important perceived curriculum topics for faculty and residents were osteopathic structural examination, orthopedic exam, direct and indirect methods, osteopathic cranial manipulative medicine, pediatric OMT, common upper and lower extremity injuries, and low back pain. Each of these topics aligned well with ACGME milestones. Residents reported that integrative medicine topics such as acupuncture were a significantly more important OMM laboratory topic (mean=3.58, SD=0.996) compared to faculty (mean=2.33, SD=0.985), t (22)=-3.091, p=0.005. Study participants most commonly described ONMM in terms of the specialized knowledge required for the discipline (n=19, 79.2%) and the Tenets of Osteopathy (n=17, 70.8%), and they felt that the purpose of an ONMM residency curriculum should be to gain knowledge (n=20, 83.3%) and become a competent physician (n=19, 79.2%).

CONCLUSIONS:
The present findings were applied to the development of proposed ONMM residency curriculum guidelines and submitted to the American Academy of Osteopathy (AAO) for consideration. They are presented here as a resource for ONMM residencies to develop a program curriculum in alignment with individual program needs.

Using Learning Analytics to Examine Achievement of Graduation Targets for Systems- Based Practice and Practice-Based Learning and Improvement: A National Cohort of Vascular Surgery Fellows

Smith BK, Luman A, Yamazaki K, Tekian A, Hamstra SJ, Holmboe E, Mitchell EL, Park YS. Ann Vasc Surg. 2021 Oct;76:463-471. doi: 10.1016/j.avsg.2021.03.046. Epub 2021 Apr 24. PMID: 33905852.

BACKGROUND:
Surgeons provide patient care in complex health care systems and must be able to participate in improving both personal performance and the performance of the system. The Accreditation Council for Graduate Medical Education (ACGME) Vascular Surgery Milestones are utilized to assess vascular surgery fellows' (VSF) achievement of graduation targets in the competencies of Systems Based Practice (SBP) and Practice Based Learning and Improvement (PBLI). We investigate the predictive value of semiannual milestones ratings for final achievement within these competencies at the time of graduation.

METHODS:
National ACGME milestones data were utilized for analysis. All trainees entering the 2-year vascular surgery fellowship programs in July 2016 were included in the analysis (n = 122). Predictive probability values (PPVs) were obtained for each SBP and PBLI sub-competencies by biannual review periods, to estimate the probability of VSFs not reaching the recommended graduation target based on their previous milestones ratings.

RESULTS:
The rate of nonachievement of the graduation target level 4.0 on the SBP and PBLI sub- competencies at the time of graduation for VSFs was 13.1-25.4%. At the first time point of assessment, 6 months into the fellowship program, the PPV of the SBP and PBLI milestones for nonachievement of level 4.0 upon graduation ranged from 16.3-60.2%. Six months prior to graduation, the PPVs across the 6 sub-competencies ranged from 14.6-82.9%.

CONCLUSIONS:
A significant percentage of VSFs do not achieve the ACGME Vascular Surgery Milestone targets for graduation in the competencies of SBP and PBLI, suggesting a need to improve curricula and assessment strategies in these domains across vascular surgery fellowship programs. Reported milestones levels across all time point are predictive of ultimate achievement upon graduation and should be utilized to provide targeted feedback and individualized learning plans to ensure graduates are prepared to engage in personal and health care system improvement once in unsupervised practice.

ACGME Milestones in Global Health: Need for Standardized Assessment of Global Health Training in Obstetrics/Gynecology Residency

Monestime GM, Baird I, Rebarber A, Shirazian T. Int J Gynaecol Obstet. 2021 Sep 3. doi: 10.1002/ijgo.13914. Epub ahead of print. PMID: 34478575.

ABSTRACT:
Collective interest in global health training during US obstetrics/gynecology (Ob/Gyn) residency has grown over the past decade. The benefits of participation in global health electives have been well described. This review seeks to determine what literature exists regarding the use of Accreditation Council for Graduate Medical Education (ACGME) Milestones in Ob/Gyn residency as an assessment tool to evaluate global health programs. The PubMed database was searched from July 14, 2020 to August 20, 2021, using six search phrases: "global health curriculum(s) and ACGME"; "international health and ACGME"; "global health and Ob/Gyn residency"; "international health and Ob/Gyn residency"; "global health and Ob/Gyn residents"; and "global health curriculum(s) and Ob/Gyn residency." Publications that described global health programming outside of residency, within other medical specialties, and/or at non-US institutions were excluded from this review. In total, 259 publications resulted from the preliminary search. Five articles described US global health residency training in Ob/Gyn in some capacity. Only one publication described a specific global health elective and its evaluation with respect to ACGME Milestones. Despite growing popularity of global health electives among residency programs, few are assessing the educational value of these offerings using ACGME Milestones or describing these efforts in the literature.

Accreditation Council for Graduate Medical Education Milestones for Emergency Medicine Residency Training Incorporated into First- and Second-Year Medical Student Elective

Y Cantwell C, B Lee J, Saadat S, Bove N, Sakaria S, Wiechmann W, Wray A, Toohey S. J Adv Med Educ Prof. 2021 Jul;9(3):136-143. doi: 10.30476/jamp.2021.88982.1360. PMID: 34277844; PMCID: PMC8273531.

INTRODUCTION:
As part of its Next Accreditation System, the Accreditation Council for Graduate Medical Education and the American Board of Emergency Medicine describe 6 competencies containing 23 sub-competencies graded by milestones ranging from level 1 (expected of an incoming intern) to level 5 (demonstrates abilities of an attending) that are used to track resident training progression. To the best of our knowledge, there have been no studies introducing a milestones-based curriculum to medical students prior to their introduction to the wards, so we sought to determine the effects that a pre-clinical Emergency Medicine Interest Group (EMIG) Milestones Elective would have on preparing the students interested in Emergency Medicine (EM) as a specialty to meet the level 1 milestones prior to their intern year.

METHODS:
The elective hosted 15 events throughout the academic year, and pre- and post-curriculum surveys were administered. Thirteen first- and second-year medical students at our institution who completed the elective self-reported their perception of preparedness for each level 1 milestone in the 19 sub-competencies. A repeated measures design was used through identical pre- and post-curriculum surveys to determine any changes in self-reported preparedness for meeting level 1 milestones after completing the elective using Wilcoxon Signed Ranks Test.

RESULTS:
There was a significant increase in the median scoring from 1 to 2 ($p=0.027$) in overall self- reported preparedness for meeting the level 1 milestones included in the elective, as well as significant increases in subcategories across competencies 1-4 outlined by the ACGME. There was no significant increase in preparedness for professionalism or interpersonal communication competencies. There was no significant increase in interest in EM as a result of the elective.

CONCLUSION:
Implementing a milestones-based curriculum during the pre-clinical years shows improved self- reported preparedness of students interested in pursuing EM for meeting level 1 milestones prior to residency. Additionally, a specialty-based elective such as this one offered through EMIG may further increase interest in the field during pre-clinical years.

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.

Assessing the Transition of Training in Health Systems Science From Undergraduate to Graduate Medical Education

Santen SA, Hamstra SJ, Yamazaki K, Gonzalo J, Lomis K, Allen B, Lawson L, Holmboe ES, Triola M, George P, Gorman PN, Skochelak S. J Grad Med Educ. 2021 Jun;13(3):404-410. doi: 10.4300/JGME-D-20-01268.1. Epub 2021 Jun 14. PMID: 34178266; PMCID: PMC8207938.

BACKGROUND:
The American Medical Association Accelerating Change in Medical Education (AMA-ACE) consortium proposes that medical schools include a new 3-pillar model incorporating health systems science (HSS) and basic and clinical sciences. One of the goals of AMA-ACE was to support HSS curricular innovation to improve residency preparation.

OBJECTIVE:
This study evaluates the effectiveness of HSS curricula by using a large dataset to link medical school graduates to internship Milestones through collaboration with the Accreditation Council for Graduate Medical Education (ACGME).

METHODS:
ACGME subcompetencies related to the schools' HSS curricula were identified for internal medicine, emergency medicine, family medicine, obstetrics and gynecology (OB/GYN), pediatrics, and surgery. Analysis compared Milestone ratings of ACE school graduates to non- ACE graduates at 6 and 12 months using generalized estimating equation models.

RESULTS:
At 6 months both groups demonstrated similar HSS-related levels of Milestone performance on the selected ACGME competencies. At 1 year, ACE graduates in OB/GYN scored minimally higher on 2 systems-based practice (SBP) subcompetencies compared to non-ACE school graduates: SBP01 (1.96 vs 1.82, 95% CI 0.03-0.24) and SBP02 (1.87 vs 1.79, 95% CI 0.01- 0.16). In internal medicine, ACE graduates scored minimally higher on 3 HSS-related subcompetencies: SBP01 (2.19 vs 2.05, 95% CI 0.04-0.26), PBLI01 (2.13 vs 2.01; 95% CI 0.01- 0.24), and PBLI04 (2.05 vs 1.93; 95% CI 0.03-0.21). For the other specialties examined, there were no significant differences between groups.

CONCLUSIONS:
Graduates from schools with training in HSS had similar Milestone ratings for most subcompetencies and very small differences in Milestone ratings for only 5 subcompetencies across 6 specialties at 1 year, compared to graduates from non-ACE schools. These differences are likely not educationally meaningful.

Development and Pilot Testing of Entrustable Professional Activities for US Anesthesiology Residency Training

Woodworth GE, Marty AP, Tanaka PP, Ambardekar AP, Chen F, Duncan MJ, Fromer IR, Hallman MR, Klesius LL, Ladlie BL, Mitchell SA, Miller Juve AK, McGrath BJ, Shepler JA, Sims C 3rd, Spofford CM, Van Cleve W, Maniker RB. Anesth Analg. 2021 Jun 1;132(6):1579-1591. doi: 10.1213/ ANE.0000000000005434. PMID: 33661789.

BACKGROUND:
Modern medical education requires frequent competency assessment. The Accreditation Council for Graduate Medical Education (ACGME) provides a descriptive framework of competencies and milestones but does not provide standardized instruments to assess and track trainee competency over time. Entrustable professional activities (EPAs) represent a workplace-based method to assess the achievement of competency milestones at the point-of- care that can be applied to anesthesiology training in the United States.

METHODS:
Experts in education and competency assessment were recruited to participate in a 6-step process using a modified Delphi method with iterative rounds to reach consensus on an entrustment scale, a list of EPAs and procedural skills, detailed definitions for each EPA, a mapping of the EPAs to the ACGME milestones, and a target level of entrustment for graduating US anesthesiology residents for each EPA and procedural skill. The defined EPAs and procedural skills were implemented using a website and mobile app. The assessment system was piloted at 7 anesthesiology residency programs. After 2 months, faculty were surveyed on their attitudes on usability and utility of the assessment system. The number of evaluations submitted per month was collected for 1 year.

RESULTS:
Participants in EPA development included 18 education experts from 11 different programs. The Delphi rounds produced a final list of 20 EPAs, each differentiated as simple or complex, a defined entrustment scale, mapping of the EPAs to milestones, and graduation entrustment targets. A list of 159 procedural skills was similarly developed. Results of the faculty survey demonstrated favorable ratings on all questions regarding app usability as well as the utility of the app and EPA assessments. Over the 2-month pilot period, 1636 EPA and 1427 procedure assessments were submitted. All programs continued to use the app for the remainder of the academic year resulting in 12,641 submitted assessments.

CONCLUSIONS:
A list of 20 anesthesiology EPAs and 159 procedural skills assessments were developed using a rigorous methodology to reach consensus among education experts. The assessments were pilot tested at 7 US anesthesiology residency programs demonstrating the feasibility of implementation using a mobile app and the ability to collect assessment data. Adoption at the pilot sites was variable; however, the use of the system was not mandatory for faculty or trainees at any site.

Competencies and Milestones for Bioethics Trainees: Beyond ASBH's Healthcare Ethics Certification and Core Competencies

Sawyer KE, Dundas N, Snyder A, Diekema DS. J Clin Ethics. 2021 Summer;32(2):127-148. PMID: 34129529.

ABSTRACT:
Clinical ethics training programs are responsible for preparing their trainees to be competent ethics consultants worthy of the trust of patients, families, surrogates, and healthcare professionals. While the American Society for Bioethics and Humanities (ASBH) offers a certification examination for healthcare ethics consultants, no tools exist for the formal evaluation of ethics trainees to assess their progress toward competency. Medical specialties accredited by the Accreditation Council for Graduate Medical Education (ACGME) use milestones to report trainees' progress along a continuum of professional development as a means of "operationalizing and implementing" medical competencies. Utilizing the Core Competencies for Healthcare Ethics Consultation and the ACGME and American Board of Pediatrics' (ABP) Pediatric Milestones Project, we developed milestones for 17 subcompetencies in clinical ethics consultation and academic bioethics. As the field of clinical ethics becomes more standardized, such tools will be needed to promote the development of robust training programs and to certify that their graduates are competent practitioners.

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.

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. 2021 Jan-Mar;42(1):2-12. doi: 10.1080/02701960.2018.1532891. Epub 2018 Dec 18. PMID: 30558514.

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.

Well-Being Curriculum for Anesthesiology Residents: Development, Processes, and Preliminary Outcomes

Janosy NR, Beacham A, Vogeli J, Brainard A. Paediatr Anaesth. 2021 Jan;31(1):103-111. doi: 10.1111/pan.14062. Epub 2020 Dec 12. PMID: 33145909.

ABSTRACT:
Physician burnout and healthcare worker stress are well-covered topics in both the medical and lay press. Burnout in physicians can start as early as medical school. Well-being initiatives, programming, and access to support for all medical professionals are of paramount importance. In 2014, the Accreditation Council for Graduate Medical Education (ACGME) Milestones for Resident/Fellow Education in Anesthesiology added Professionalism as a milestone. A subcategory of Professionalism includes: A responsibility to maintain personal, emotional, physical, and mental health. This subcategory charges all residency and fellowship programs with establishing a curriculum in well-being. The development, execution, and evaluation of these programs are left to the individual institutions. In this paper, the development, processes, and preliminary outcomes of a resident well-being curriculum are presented.

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.

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.

The Implementation of ACGME 'Reporting Milestones' in Internal Medicine Postgraduate Year Training Program - Experience Sharing and Preliminary Outcome

Hsiao-Ju L, Jhong-Han W, Chia-Yu L, Pei-Jen T, Chiung-Yu C. 醫學教育/ Journal of Medical Education. 2020;(3):161. doi:10.6145/jme.202009_24(3).0005

PURPOSE:
Competency-based medical education has been the current trend of education, and milestones assessment is one of the means to practice it. We hereby shared our experience and preliminary results in applying reporting milestones in our postgraduate year (PGY) training program.

METHODS:
We translated the English version of 'reporting milestones' to Chinese one and built the electronic report worksheets on our web-system. Milestones assessments were conducted at the end of every month since August 2018. We analyzed the completion rate and the results of the assessments in the 2018 academic year by using IBM SPSS Statistics version 23.

RESULTS:
The completion rate of milestones assessments was 96.7% (175/181), of which the most frequent unassessed subcompetencies were patient care (PC)-4 and PC-5 (both n = 9). The mean levels of the subcompetencies ranged from 3.5 to 4 on a scale of 1-5. Our PGY physicians demonstrated better in subcompetencies systems-based practice (SBP)-1, practice-based learning and improvement (PBLI)-1, and PBLI-3 (mean levels 4.0 ± 0.4, 4.0 ± 0.4, 4.0 ± 0.5, respectively), and worse in subcompetence SBP-3 (mean levels 3.5 ± 0.6) ($p < 0.05$ by ANOVA). The progress of all subcompetencies between the first and third months of rotation course was insignificant.

CONCLUSIONS:
We accomplished the reporting milestones assessments in our hospital. Our experience in implementing milestones can be as a reference for other hospitals. The learning outcomes from milestones assessments may be helpful to improve our PGY program.

North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition Position Paper on Entrustable Professional Activities: Development of Pediatric Gastroenterology, Hepatology, and Nutrition Entrustable Professional Activities

Sauer CG, Robson J, Turmelle YP, Cerezo CS, Loomes KM, Huang JS, Quiros-Tejeira RE, Benkov KJ, Narkewicz MR, Leichtner A, Weinstein T. J Pediatr Gastroenterol Nutr. 2020 Jul;71(1):136-143. doi: 10.1097/MPG.0000000000002684.

ABSTRACT:
Quality training in pediatric gastroenterology, hepatology, and nutrition is essential for the future of our specialty from advancing the science through research to providing clinical care for children with gastrointestinal, hepatic and nutritional disorders. As educational theory has developed, both the American Board of Pediatrics (ABP) and the Accreditation Council for Graduate Medical Education (ACGME) have commissioned projects to better define training including core competencies, and milestones with the goal of competency-based assessment. Seeking to provide a clinical context for these competencies and milestones, the ABP commissioned a project for each pediatric subspecialty to develop entrustable professional activities (EPA) while at the same time developing EPAs that are common to all pediatric subspecialties. North American Society for Pediatric Gastroenterology, Hepatology, Nutrition (NASPGHAN) commissioned an EPA Task Force to develop the pediatric gastroenterology, hepatology and nutrition EPAs. This document serves as an introduction to EPAs, including their historical background, underlying educational theory, and the process used to develop the pediatric gastroenterology, hepatology and nutrition EPAs in the United States of America.

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

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

CONSTRUCT:

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

APPROACH:

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

RESULTS:

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

CONCLUSIONS:

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

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.

Development of an Educational Curriculum for Spinal Cord Stimulation

Abd-Elsayed A, Abdallah R, Falowski S, Chaiban G, Burkey A, Slavin K, Aziz M, Raslan AM. Neuromodulation. 2020 Apr 13. doi: 10.1111/ner.13142. [Epub ahead of print]

BACKGROUND:
Spinal cord stimulators (SCSs) are used for treating chronic pain. The number of SCSs implanted each year is on the increase. The North American Neuromodulation Society (NANS) education committee aimed to develop a SCS curriculum as a tool to guide physicians at different training levels, based on the most recent evidence.

MATERIAL AND METHODS:
A multidisciplinary (anesthesiology, physical medicine, neurosurgery, and neurology), taskforce representing the education committee of the NANS met to develop a SCS curriculum following the Accreditation Council for Graduate Medical Education (ACGME) milestones. The task force used the best available evidence and knowledge to develop the curriculum. Once developed, the SCS curriculum was then approved by the NANS board.

RESULTS:
The task force developed a SCS training curriculum. Milestones included patient care and procedural skills, system-based practice, medical knowledge, interpersonal communication, practice based learning and professionalism. Each milestone was defined for three categories, early learner, advanced learner, and practitioner.

CONCLUSION:
A multidisciplinary task force of the NANS education committee developed a SCS training curriculum that defines ACGME milestones for basic learners, advanced learners, and practitioners.

Fellow-Led SICU Morbidity and Mortality Conferences Address Patient Safety, Quality Improvement, Interprofessional Cooperation and ACGME Milestones

Weingarten N, Issa N, Posluszny. Am J Surg. 2020 Feb;219(2):309-315. doi: 10.1016/j.amjsurg.2019.01.026. Epub 2019 Jan 28.

BACKGROUND:
Morbidity and mortality conferences (MMCs) promote patient safety, spur quality improvement (QI) projects, and enhance interprofessional cooperation. The use of MMCs to address the Accreditation Council for Graduate Medical Education's (ACGME's) six core competencies and specialty-specific milestones for surgical critical care (SCC) fellows has yet to be explored.

METHODS:
We developed a monthly, interprofessional, case-based MMC program managed by SCC fellows. We assessed participants' experiences through post-conference surveys and semi-structured interviews.

RESULTS:
After nine conferences, 95.1% of participants (n = 143) agree or strongly agree that the MMC improved their knowledge and clinical assessment skills. The MMC spurred two QI projects, increased interprofessional cooperation, and addressed all six ACGME core competencies and 16 specialty- specific milestones.

CONCLUSIONS:
Interprofessional, case-based MMCs are an effective educational tool for SCC fellowship programs. They promote patient safety, QI, and interprofessional cooperation, and address ACGME core competencies and specialty-specific milestones for SCC fellows.

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

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

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

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

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

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

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

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

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

Development of a Novel Competency-Based Evaluation System for HIV Primary Care Training: the HIV Entrustable Professional Activities

Dunne D, Green M, Tetrault J, Barakat LA. J Gen Intern Med. 2020 Jan;35(1):331-335. doi: 10.1007/s11606-019-04956-1.

BACKGROUND:
There is an anticipated shortage of primary care providers trained to care for patients with HIV. The Yale School of Medicine developed and implemented a novel HIV training track within our Primary Care Internal Medicine Residency Program. A set of 12 Entrustable Professional Activities (EPAs) were developed to guide curriculum development and resident assessment.

AIM:
To describe the process of implementing a novel EPA-based curriculum for the HIV Primary Care Training Track including EPA-based trainee evaluation tools.

PARTICIPANTS/SETTINGS:
Two to three residents were enrolled annually from 2012 to 2017 (total n = 11). Training sites included the outpatient academic center HIV clinic and inpatient HIV ward.

PROGRAM DESCRIPTION:
An expert panel developed 12 HIV-specific EPAs. These were mapped to curricular and reporting internal medicine milestones. Curricular activities and evaluation tools were developed to guide EPA progress.

PROGRAM EVALUATION:
Graduating residents were ready for unsupervised practice in 91% of EPAs at the end of the 3-year program.

DISCUSSION:
Development of HIV-specific training EPAs was effective for driving curricular development and resident evaluation, and served as an effective method to communicate expectations to resident participants. These HIV-specific EPAs could serve as a useful template to enhance HIV education in academic settings.

Professionalism Milestones Assessments Used by Emergency Medicine Residency Programs: A Cross-sectional Survey

Stehman CR, Hochman S, Fernández-Frackelton M, Volz EG, Domingues R, Love JN, Soares W. West J Emerg Med. 2019 Dec 19;21(1):152-159. doi: 10.5811/westjem.2019.11.44456.

INTRODUCTION:
Professionalism is a vital component of quality patient care. While competency in professionalism is Accreditation Council for Graduate Medical Education (ACGME)-mandated, the methods used to evaluate professionalism are not standardized, calling into question the validity of reported measurements. We aimed to determine the type and frequency of methods used by United States (US) - based emergency medicine (EM) residencies to assess accountability (Acc) and professional values (PV), as well as how often graduating residents achieve competency in these areas.

METHODS:
We created a cross-sectional survey exploring assessment and perceived competency in Acc and PV, and then modified the survey for content and clarity through feedback from emergency physicians not involved in the study. The final survey was sent to the clinical competency committee (CCC) chair or program director (PD) of the 185 US-based ACGME-accredited EM residencies. We summarized results using descriptive statistics and Fisher's exact testing.

RESULTS:
A total of 121 programs (65.4%) completed the survey. The most frequently used methods of assessment were faculty shift evaluation (89.7%), CCC opinion (86.8%), and faculty summative evaluation (76.4%).
Overall, 37% and 42% of residency programs stated that nearly all (greater than 95%) of their graduating residents achieve mastery of Acc and PV non-technical skills, respectively. Only 11.2% of respondents felt their programs were very effective at determining mastery of non-technical skills.

CONCLUSION:
EM residency programs relied heavily on faculty shift evaluations and summative opinions to determine resident competency in professionalism, with feedback from peers, administrators, and other staff less frequently incorporated. Few residency programs felt their current methods of evaluating professionalism were very effective.

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.

The Case for Observation Medicine Education and Training in Emergency Medicine

Pena ME, Wheatley MA, Suri P, Mace SE, Kwan E, Baugh CW. AEM Educ Train. 2019 Dec 19;4(Suppl 1):S47-S56. doi: 10.1002/aet2.10413. eCollection 2020 Feb.

BACKGROUND:
Many hospitals have or will be opening an observation unit (OU), the majority managed by the emergency department (ED). Graduating emergency medicine (EM) residents will be expected to have the knowledge and skills necessary to appropriately identify and manage patients in this setting. Our objective is to examine the current state of observation medicine (OM) education and prevalence in EM training.

METHODS:
In a follow-up to the 2019 Society for Academic Emergency Medicine (SAEM) OM Interest Group meeting, we convened an expert panel of OM physicians who are members of both the SAEM OM Interest Group and the American College of Emergency Physicians Section of OM. The panel of six emergency physicians representing geographic diversity was formed. A structured literature review was performed yielding 16 educational publications and sources pertaining to OM education and training across all specialties.

REPORT ON THE EXISTING LITERATURE:
Only a small number of EM residencies have a required or elective OM rotation in an OU. An OM rotation in a protocol-driven ED OU gives residents experience managing patients in this setting and improves skills integral to EM and part of the EM milestones and Accreditation Council for Graduate Medical Education (ACGME) core competencies: reassessment, disposition decision making, risk stratification, team management, and practicing cost-appropriate care. Even without a formal rotation, multiple OM educational resources can be incorporated into EM resident education and didactics. Education research opportunity exists.

CONCLUSIONS:
This panel believes that OM is an important component of EM that should be incorporated into EM residency as the knowledge and skills learned such as risk stratification, disposition decision making, and team management augment those needed for the practice of EM. There is a distinct opportunity for EM educators to better equip their trainees for a career in EM by including OM education and experience in EM residency training.

Using an Entrustable Professional Activity to Assess Consultation Requests Called on an Internal Medicine Teaching Service

Kang AJ, Gielissen K, Windish D. MedEdPORTAL. 2019 Nov 22;15:10854. doi: 10.15766/mep_2374- 8265.10854.

INTRODUCTION:
The Accreditation Council for Graduate Medical Education's milestones require internal medicine residents to have competency in calling consults. Based on a literature review, we developed an Entrustable Professional Activity (EPA) to delineate the knowledge, skills, and attitudes required for a consultation request and, building on the EPA, implemented an assessment instrument to provide feedback to interns calling consultation requests and assess the quality of their consult questions and the level of supervision required in performing this milestone.

METHODS:
Assessments were done on internal medicine inpatient teaching services. Consultation requests were performed by interns and observed by residents using the assessment instrument. Feedback was provided to the interns. Interns then completed a self-reflection instrument based on the feedback.

RESULTS:
Twenty-six paired observations were collected over three 1-month rotations. There was a moderate positive correlation (r = .43) comparing resident and intern responses to how they felt about the intern's ability to make a consultation request. There was a strong positive correlation (r = .65) comparing resident opinion of how strong the intern's ability in calling a consult to how well the consult question used the PICO (patient, intervention, comparators, outcomes of interest) framework. Twenty-five out of 28 interns (89%) said they would make a change during their next consultation request due to feedback from their resident.

DISCUSSION:
Our EPA-based assessment instrument provided an opportunity to give interns feedback and to assess the quality of the consultation requests they made.

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.

Milestones as a Guide for Academic Career Development

Blake GH, Kemmet RK, Jenkins J, Heidel RE, Wilson GA. Fam Med. 2019 Oct;51(9):760-765. doi: 10.22454/FamMed.2019.109290.

BACKGROUND AND OBJECTIVES:
Faced with a limited supply of applicants for faculty positions, increasing demands for residency faculty, and a growing number of programs, our program has increasingly filled ranks with recent residency graduates with broad scope but limited experience and training in academics. These early- career clinicians often require further mentorship as they seek advancement in clinical skills and development of teaching and scholarly activity skill sets.

METHODS:
To educate our recent residency graduates in teaching/scholarly activity skills, and to provide a career trajectory, we created a process to guide their maturation with milestones using the six core competencies from the Accreditation Council for Graduate Medical Education. The milestones consist of four levels of clinician/academician maturation. Each competence has goals and activities for each level of development. We validated the milestones using our physician faculty assessing time spent in academic medicine and academic rank.

RESULTS:
Faculty of higher academic rank scored higher in all competencies than faculty of lower academic rank. Correlation between systems-based practice and years in academics demonstrated statistical significance, and all other categories showed nonsignificant associations.

CONCLUSIONS:
The milestones are consistent with faculty academic development and career progression, and may serve as a guide for career advancement and as a guideline for professional progression for residency clinicians. Further testing for validation in other family medicine programs is necessary, but preliminary findings indicate this milestone project may be of service to our profession.

Building Provider-Caregiver Partnerships: Curricula for Medical Students and Residents

Blackie M, Baughman KR, Palmisano B, Sanders M, Sperling D, Scott E, Radwany S, Drost J, Thomas J. Acad Med. 2019 Oct;94(10):1483-1488. doi: 10.1097/ACM.0000000000002806.

PROBLEM:
A disconnect exists between caregivers and health care providers, resulting in fragmented communication, which increases caregiver stress and compromises patient care. Although providers have a responsibility to recognize caregiver burden, they receive scant training on issues important to caregivers.

APPROACH:
From 2014-2017, as part of the Building Caregiver Partnerships Through Interprofessional Education project-a collaborative effort between Northeast Ohio Medical University and Summa Health-the authors developed curricula to foster effective partnerships between health care providers and caregivers by exposing medical students and residents to highly personal caregiving narratives. The curricula center on a short film featuring four families representing diverse caregiving experiences. The authors crafted several discussion guides, case-based learning exercises, structured clinical encounters, team-based simulations, and clinical cases as companion educational tools for the film.

OUTCOMES:
Medical students reported the educational tools piloted to be valuable in broadening their understanding of caregivers' needs, while residents reported the educational tools piloted to also be valuable in improving their communication and building partnerships with caregivers. Undergraduate and graduate faculty reported finding the pilots valuable.

NEXT STEPS:
Future goals include conducting an outcome evaluation, based on ACGME milestones, to identify and examine the clinical outcomes to determine if communication increases and quality of care improves as a result of the project. The authors we would also like to include caregivers in the evaluation.
Finally, because caregiving is best addressed from a team approach, the authors would like to pilot the project at other health professions programs.

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

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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.

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

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

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

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

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

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

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

A Review of Orthopedic Resident Outpatient Notes Are Perceptions of the EMR Reflected in Current Documentation Practices?

Phillips D, Fisher N, Karia R, Kalet A. Bull Hosp Jt Dis (2013). 2019 Sep;77(3):194-199.

INTRODUCTION:
Systems-based Practice 3 (SBP 3) in the orthopedic residency developmental milestones evaluates residents' knowledge, understanding, and utilization of the electronic medical record (EMR). In order to better assess SBP 3, we conducted a review of residents' clinical notes in order to quantify the current state of orthopedic residents' documentation in the EMR. The purpose of this study was to objectively evaluate orthopedic resident documentation in the EMR.

METHODS:
Orthopedic resident medical notes from a single orthopedic residency at one academic medical center were scored by faculty members who had directly observed the clinical encounter. These notes were then independently scored by one investigator (N.F.) using clinical content specific, objective criteria. Sixty-five medical records were reviewed. All 62 orthopedic residents anonymously completed an 84-question survey on the value of EMR utilization and documentation within the medical record.

RESULTS:
Many key elements necessary to diagnosing a patient's injury and developing a treatment plan were often omitted (e.g., "Mechanism of Injury" in 32.3% of records), and the majority of notes did not include "Decision Making and Patient Preference" (95.2%) or "Risks/Benefits of Surgery" (93.7%). However, 95.2% of residents agreed that their notes reflect their medical knowledge and 96.8% agreed that their notes reflect their clinical reasoning.

DISCUSSION:
The results of this objective review revealed significant deficits in orthopedic resident documentation not identified by faculty observers.

Focused Teaching Improves Medical Student Professionalism and Data Gathering Skills in the Emergency Department

Smith C, Likourezos A, Schiller J. Cureus. 2019 Sep 25;11(9):e5765. doi: 10.7759/cureus.5765.

INTRODUCTION:
Leaders in medical education have developed milestones and core competencies in an attempt to ensure that relational skills, such as communication and professionalism, are emphasized in addition to the usual skills of medical knowledge, data gathering, and emergency stabilization during students' emergency medicine (EM) medical education. Providers facile in each of these areas have better patient outcomes, patient experiences, and decreased incidence of malpractice cases. The authors attempted to demonstrate that by deliberate teaching of these skills during an EM medical student clerkship, students could significantly improve their clinical performance.

METHODS:
This prospective, randomized, single-blinded cohort study was performed at an academic, tertiary, urban ED to investigate the effects of a one-on-one preceptor shift on the clinical performance of fourth-year medical students. Students were randomized into two groups and assessed by pre- and post-intervention objective structured clinical encounters (OSCEs) with standardized patients (SPs) at weeks one and three. A crossover design was employed so that students in the control group participated in a preceptor shift after their second OSCE. Measurements were based on a five-point Likert scale assessment linked to early EM milestones as defined by the Accreditation Council on Graduate Medical Education (ACGME).

RESULTS:
The mean improvement in total overall score was significantly greater in the intervention group: 4.31 versus 2.57 (Cohen's d = 0.57, p = 0.029). When each milestone was assessed individually, students in the intervention group improved significantly in data gathering (Cohen's d = 0.47, p = 0.048) and professionalism (Cohen's d = 0.66, p = 0.011). There was a nonstatistically significant improvement for the intervention compared to control group in emergency management and communication skills. There was no improvement for either group in medical knowledge.

CONCLUSION:
A one-on-one preceptor shift can result in a statistically significant improvement in data gathering and professionalism skills as measured by OSCEs.

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.

A Milestone-Based Pediatric Intern Boot Camp: An Educational Intervention to Minimize the July Effect

Novosel A, van de Ridder M, Smith-King C, McLeod M, Triemstra J. Academic Pediatrics. 2019 Aug; (6). doi:10.1016/j.acap.2019.05.083.

INTRODUCTION:
The transition from student to intern is difficult and highlighted by performance missteps often referred to as the July Effect. Some pediatric institutions have implemented intern boot camps (IBC) to better prepare interns at the start of residency. Such pediatric boot camps described in the literature have not specifically targeted the ACGME/ABP Pediatric Milestones. We implemented an IBC that utilized these milestones to improve the interns' confidence, knowledge, and skills. Methods 19 new interns participated in the IBC at the HDVCH/MSU Pediatric Residency Program. We used Kerns Six-Step Approach as a conceptual framework and targeted 3 levels of Kirkpatrick's level of evaluation (reaction, learning, and behavior). A needs assessment from residents and faculty was used to identify specific milestones. We designed our IBC to include lectures, workshops and clinical experiences to target these milestones. A questionnaire containing 15-confidence (Likert Scale 1-5) and 10 knowledge-based questions was given before and after the IBC. The paired t-test was used to assess total confidence scores and pre/post knowledge measures. The sign test was used to compare individual confidence questions. Block 1 milestone evaluations were analyzed for pre-IBC (2016, 2017) and post-IBC interns (2018). Significance was assessed at $p<0.05$.

RESULTS:
Interns demonstrated a significant improvement in their overall confidence score (Pre: 47.7+/-4.1, Post: 58.6+/-5.3; $p<0.001$). All individual confidence questions showed increases. Interns demonstrated a significant improvement in perceived pediatric knowledge on the post-IBC test (Pre: 5.2+/-1.5, Post: 6.8+/-1.3; $p=0.004$). Block 1 evaluations from 7/2018 did not show improved evaluations when compared to pre-IBC cohorts.

CONCLUSIONS:
Incoming interns demonstrated a significant improvement in confidence and perceived knowledge of the targeted pediatric milestones after participating in the IBC. Our innovative approach of targeting pediatric milestones in an IBC suggests that such a targeted curriculum helps the difficult transition for interns.

Program Director Minimum Milestone Expectations of Pediatric Residents before Ready to Supervise Others and Before Graduation

Li S-TT. 56. Academic Pediatrics. Aug 2019;19(6):e26. doi:10.1016/j.acap.2019.05.070.

BACKGROUND:
In 2013, the Accreditation Council for Graduate Medical Education (ACGME) began requiring program directors (PDs) to report Milestone levels for every resident semiannually. Our prior 2015 survey found that few PDs had minimum Milestone level expectations before residents are ready to supervise (20%) or ready to graduate (20%).

OBJECTIVE:
Characterize present day model for pediatric PD minimum Milestone expectations for residents before being ready to supervise and graduate.

METHODS:
Cross-sectional survey in Spring 2018 of pediatric PDs on their program Milestone expectations before residents are ready to supervise and graduate. At programs with no established Milestone expectations, PDs indicated expectations they considered for use in their program. Descriptive analyses were used to explore PD minimum expectations by level of training.

RESULTS:
Response rate was 46.2% (93/201). Few programs have minimum Milestone levels before residents are ready to supervise (22.6%; 21/93) or graduate (36.6%; 34/93). Minimum expectations before a resident was ready to supervise were highest for trustworthiness (Prof5), professional conduct (Prof3), professionalization (Prof2), transfer of care (PC3), organize and prioritize (PC2), humanism (Prof1), and help-seeking (Prof4), where most PDs felt that Level 2.5 was the minimum expectation. PD expectations for supervising residents were lowest for learning activities (PBLI2) and advocacy (SBP2), where the majority of PDs felt that there was no minimum or that Level 1 was sufficient. Minimum expectations for graduates were highest for diagnostic/therapeutic decisions (PC4), develop management plans (PC5), gather information (PC1), organize and prioritize (PC2), professionalization (Prof2), and trustworthiness (Prof5), where >70% of PDs felt that Level 3.0 was the minimum (Figure). PD expectations for graduating residents were lowest for quality improvement (PBLI3), advocacy, learning activities, and evidence-based medicine (MK), where >40% of PDs felt that Level 2.5 was the minimum.

CONCLUSIONS:
Five years after the ACGME required Milestone reporting, only a minority of PDs have established minimum Milestones before residents are ready to supervise or ready to graduate. However, more PDs have minimum Milestone levels before residents are ready to graduate than in 2015 (36.6% vs 20%) and PDs recognize the relative importance of different competencies in establishing readiness to supervise and readiness to graduate.

An Examination of Advocacy Education in Residency Training

Black CC, Motta A. Arch Pathol Lab Med. 2019 Jul 17. doi: 10.5858/arpa.2019-0116-EP.

CONTEXT:
Pathology-related advocacy is best when performed directly by pathologists. Practicing advocacy is included in the Milestones 2.0 and should be introduced during residency training.

OBJECTIVE:
To understand advocacy education in residency training we surveyed pathologists to ask what training they had in residency, what resources were available, and what experiences were most impressionable.

DESIGN:
Two types of inquiry were performed. First, a survey to program graduates asking about leadership and advocacy activities during training and about leadership and advocacy activities since graduation. Secondly, focused email and telephone inquiries were made to 12 pathologists-4 in practice for more than 20 years, 4 within the first 10 years of practice, and to 4 PGY4 (postgraduate year 4) residents- asking what training and experiences were available to them, and how they became motivated to become active in practice.

RESULTS:
Our results showed that resources available outside of the home program have changed through the years and more national resident groups are available that were not available in the past. These groups may educate trainees in leadership and advocacy. Internally, opportunities to shadow faculty at interdepartmental leadership meetings, as well as selection of the Chief Resident, are enduring tools for honing these skills.

CONCLUSIONS:
Teaching advocacy in training is important and part of the Accreditation Council for Graduate Medical Education core requirements as well as a level 5 Milestone. Education may require a balance of internal and external resources, since different programs may offer different opportunities. Shadowing during real advocacy events was the most impressionable experience.

An Emergency Medicine Milestone-Based Simulation Curriculum: Acute Ischemic Stroke

Turner-Lawrence D, Hang BS, Shah P, Levasseur K. MedEdPORTAL. 2019 Jun 18;15:10829. doi: 10.15766/mep_2374-8265.10829.

INTRODUCTION:
The emergency medicine (EM) resident's ability to make independent decisions in the setting of acute ischemic stroke has been reduced as a result of the involvement of multidisciplinary teams. This simulation was created to give EM residents the opportunity to independently manage the early stages of ischemic stroke and its complications.

METHODS:
A solo learner was presented with a 55-year-old male with complaints consistent with an acute stroke. The resident had to calculate stroke severity; coordinate hospital resources; discuss risks, benefits, and alternatives to thrombolysis; and deal with subsequent complications. The learner had to keep a broad differential for sudden change in mental status and consider alternative interventions. Strategies to decrease intracranial pressure needed to be implemented while obtaining neurosurgical consultation. Debriefing included discussion of expected actions in the context of the Accreditation Council for Graduate Medical Education (ACGME) milestones. Residents' review of their video performance added additional self-reflection.

RESULTS:
A total of 69 PGY 3 EM residents independently participated in this simulation over a 5-year period. Thirty-two completed a postsimulation evaluation. Nearly all learners felt that this case reflected an actual patient encounter and increased their confidence in managing stroke. The milestone-based feedback tool was completed with all learners. Anticipated actions linked to Level 1 and 2 milestones were regularly achieved while acquisition of Level 3 and 4 actions varied.

DISCUSSION:
Case actions were uniquely characterized by the ACGME milestones, which helped to delineate learners' knowledge gaps and provided concrete areas for improvement.

Multilevel Quality Improvement Teams: An Alternative Approach for Surgical Academic Training Programs to Meet ACGME Core Competency Milestones

Hajjar-Nejad MJ, Kubicki N, Morales D, Kavic SM. J Surg Educ. 2019 May-Jun;76(3):785-794. doi: 10.1016/j.jsurg.2018.10.006. Epub 2018 Nov 22.

BACKGROUND:
Quality improvement (QI) activities are an integral part of residency training. We started the process to implement team-based, multilevel QI project streams within our academic surgical residency by studying resident perceptions.

OBJECTIVE:
Our residency carried out 6 QI projects in line with the American Council for Graduate Medical Education competencies. A resident survey was completed in 2016 to measure resident perceptions of an individual versus team-based QI project approach.

METHODS:
This was a descriptive study looking at resident's preference for team projects and ongoing projects within the training program. We started in 2014 utilizing Wait's Team Action Projects in surgery paradigm to conduct 6 QI projects. After initiation of projects, we allotted 2 full years to pass prior to assessing resident perceptions via a 12-item survey.

RESULTS:
Notably, this was a descriptive study aiming to capture resident perceptions on team-based QI and the foundational elements necessary to create and sustain such projects by integrating into our curriculum from the intern year. In 2016, 40 residents completed surveys (72.7% response rate), all (100%) opined that they preferred team-based approaches over individual ones, and 75% were on board to move forward with only a team-based approach in the future.

CONCLUSIONS:
This was a pivotal start to adopting a team-based QI project strategy in the future and laid a solid foundation to build upon. We found residents in our program desire to work within teams early on to develop effective solutions to clinical problems. Residents perceived that the team-based model resulted in an improved resident experience with the QI process and improved patient care. We hope to publish a series of articles updating our progress as we move forward in this endeavor.

The Implementation of an Introductory Surgical Pathology Didactic Series to Transition First Year Residents and Facilitate Upper Level Resident Teaching

Mehr CR, Montone KT, Schwartz LE. Adv Anat Pathol. 2019 May;26(3):210-214. doi: 10.1097/ PAP.0000000000000229.

ABSTRACT:
The increasing complexity of the practice of pathology and health care in general requires that pathology residents acquire a vast number of skills during their training. This has been reflected by the broad range of skills addressed in the Accreditation Council for Graduate Medical Education (ACGME) milestones. In order to address some of these milestones, our residency program instituted an introductory didactic series in surgical pathology that focused on 2 objectives. First, the didactics provided basic grossing and histology training to first year residents transitioning from medical school. Second, the sessions allowed upper level residents to refine their teaching and communication skills at the microscope and therefore served as an important career development tool. Surveys of both first year residents and the upper level residents that led these sessions confirm the utility of these didactics and the use of upper level residents to teach junior trainees. In addition, these sessions led to a dramatic increase in RISE scores among first year trainees. An introductory series with upper level residents leading slide sessions could easily be replicated at other institutions and provide similar benefits.

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

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

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

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

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

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

Psychotherapy Competency Milestones: An Exploratory Pilot of CBT and Psychodynamic Psychotherapy Skills Acquisition in Junior Psychiatry Residents

Ravitz P, Lawson A, Fefergrad M, Rawkins S, Lancee W, Maunder R, Leszcz M, Kivlighan DM Jr. Acad Psychiatry. 2019 Feb;43(1):61-66. doi: 10.1007/s40596-018-0940-4. Epub 2018 Jun 1.

OBJECTIVE:
Psychiatry residents train in Psychodynamic Psychotherapy and Cognitive Behavioral Therapy (CBT), evidence-supported treatments used in mental health care that can facilitate clinical reasoning, foster therapeutic alliances, and improve clinical outcomes. However, empirically derived milestones are needed to evaluate competency. This exploratory pilot examined changes over 1 year of training in junior psychiatry residents' competency milestone elements in Psychodynamic Psychotherapy and CBT.

METHODS:
Seventy-nine randomly selected audio-recorded sessions from differing phases of Psychodynamic Psychotherapy and CBT with five junior residents and ten patients were rated using the Psychotherapy Process Q-sort (PQS).

RESULTS:
In both treatments, patient engagement with attention to in-session emotions improved. In CBT, residents were directive, supported patients' self-efficacy, emphasized patients' accepting responsibility for their problems, discussed homework such as thought records, and focused on termination in the concluding sessions. In Psychodynamic Psychotherapy, residents attended to emotional arousal and linked patients' feelings or perceptions to past situations or behavior. Growth and hierarchical linear modeling differentiated these treatments, with CBT v. Psychodynamic adherence to PQS modality- specific ideal elements being 52% v.19%.

CONCLUSION:
Teaching and observation using empirically derived observable psychotherapy practice behaviors is feasible and can be used to assess milestone elements for competency-based education of psychiatry trainees.

Towards a Consensus for Musculoskeletal Ultrasonography Education in Physical Medicine & Rehabilitation: A National Poll of Residency Directors

Bockbrader MA, Thompson RD, Way DP, Colachis SC, Siddiqui IJ, Luz J, Borg-Stein J, O'Connor K, Kohler MJ, Bahner DP. Am J Phys Med Rehabil. 2019;98(8):715-724. doi:10.1097/PHM.0000000000001195.

OBJECTIVES:
To evaluate integration of musculoskeletal ultrasonography (MSKUS) education in Physical Medicine & Rehabilitation (PM&R) training programs in 2014-15, when the American Academy of Physical Medicine & Rehabilitation and Accreditation Council for Graduate Medical Education (ACGME) Residency Review Committee both recognized it as a fundamental component of physiatric practice; to identify common MSKUS components of PM&R residency curricula; and to identify common barriers to integration.

DESIGN:
Survey of 78 ACGME-accredited PM&R residency programs.

RESULTS:
The 2015 survey response rate was over 50%, and respondents were representative of programs across the U.S. Most programs (80%) reported teaching MSKUS, while a minority (20%) required mastery of ultrasonography skills for graduation. Ultrasonography curricula varied, though most programs agreed that the scope of resident training in PM&R should include diagnostic and interventional MSKUS, especially for key joints (shoulder, elbow, knee, wrist, hip, and ankle) and nerves (median, ulnar, fibular, tibial, radial, and sciatic). Barriers to teaching included insufficient expertise of instructors, poor access to equipment, and lack of a structured curriculum.

CONCLUSION:
MSKUS has become a required component of PM&R residency training. Based on survey responses and expert recommendations, we propose a structure for MSKUS curricular standards and milestones for trainee competency.

Craniofacial Skills: A 2-Site Validation of Assessments to Aid Plastic Surgery Resident Milestone Achievement in Technical Skills and Instrument Knowledge

Grunzweig KA, Son J, Kumar AR. J Craniofac Surg. 2019;(6):1678. doi: 10.1097/ SCS. 0000000000005412. SCS.0000000000005412.

BACKGROUND:
Plastic surgery evaluates residents on milestones. This study defines a model of education including pre and post-test assessments paired with didactics intended for evaluating residents in the unique technical skills of craniofacial surgery.

METHODS:
At the first institution, instrument identification, and time/accuracy of burr hole placement, craniotomy, and plating on Saw Bones Craniofacial Models were tested before and after a 7.5-hour craniofacial orthognathic surgery workshop. At the second institution, this was refined, removing plating, eliminating assessment of timing, and shortening didactics to standard osteotomies, instrument names, and common surgical approaches. The study population consisted of junior, mid-level, and senior residents on 2 different University craniofacial services.

RESULTS:
Participant performance was analyzed by level of training: junior, midlevel and senior resident. In the first iteration, resident times improved significantly for all 4 tasks (P=0.008, 0.035, 0.035, 0.016).

Resident accuracy improved significantly for instrument naming (P=0.003). Except for instrument naming, resident year did not impact improvement (timing: P=0.062, 0.310, 0.125, 0.334; accuracy: P=0.029, 664, 0.717, 0.306). In the second iteration, resident accuracy improved for all tasks (instrument naming P=0.00002, burr holes P=0.0031, craniotomy P=0.08). There was no difference in rate of improvement between resident cohorts.

CONCLUSION:
The task-based assessment with resident education on basic craniofacial surgery skills, standard osteotomies, and instrument names directed resident learning and assessed resident knowledge. With the removal of time as a metric, all tasks improved in accuracy. The craniofacial skills task- assessment successfully evaluated milestone attainment in a reproducible model

Application Factors Associated with Clinical Performance during Pediatric Internship: A 5-Year Single Center Retrospective Cohort Study

Gross C J, O'Halloran C, Deshpande S, Lux S, Sectish T, Michelson C, Winn A, Sox C. 64. Academic Pediatrics. 2019;(6). doi:10.1016/j.acap.2019.05.078.

BACKGROUND:
The specific components of an application to residency that predict clinical performance during training in pediatrics remain unknown.

METHODS:
Retrospective cohort study of all pediatric interns who matched into the Boston Combined Residency Program from 2013-2017. Demographics, subspecialty track, medical school ranking, USMLE scores, advanced degrees, clerkship grades, Alpha-Omega-Alpha (AOA) and Gold Humanism Honor Society membership, interview day performance, letters of recommendation (LOR) strength, and number of publications were extracted from application materials. The primary outcome was clinical performance at the end of internship, measured as a weighted average of existing ACGME pediatric milestones scores. Linear mixed effects modeling with random effects for grading committee and match year was used to identify factors independently associated with clinical performance. Variables with p-values <0.2 in bivariate analysis were included in the final model.

RESULTS:
223 interns were included in the study. In the model (Table 1), higher average LOR score (B=.07, p=.01), having a master's degree (B =.19, p=.03), and not having a PhD (B =.13, p=.03) were associated with more advanced clinical performance at the end of pediatric internship. AOA membership, medical school ranking, public medical school attendance, time off prior to medical school, number of clerkship honors, and interview score were included in the model, but not significant predictors of clinical performance. The fixed effects explained 15% of the variance in milestones score, while the random effects (match year and grading committee) explained 8% of the variance (marginal R2=.15, conditional R2=.23).

CONCLUSIONS:
Strong letters of recommendation, having a master's degree and not having a PhD are associated with more advanced clinical performance during pediatric internship. However, much of the variance in clinical performance remains unexplained by quantifiable application variables.

Does Orthopaedic Resident Efficiency Improve with Respect to Decreased Fluoroscopic Times in Tibial Intramedullary Nailing? A Measure of an ACGME Milestone

Bradburn K, Patel JH, Cannada LK. Current Orthopaedic Practice. 2019;(2):129. doi:10.1097/ BCO.0000000000000733.

BACKGROUND:
Intramedullary nailing of tibial fractures is a surgical milestone from the Accreditation Council for Graduate Medical Education (ACGME). Our purpose was to evaluate if fluoroscopic time decreased with increasing resident experience and could be used as a measure of this milestone.

METHODS:
Current Procedural Terminology (CPT) codes were used to identify patients who underwent intramedullary nailing of tibial shaft fractures under the direction of fellowship-trained trauma attending staff. The data collected included patient demographics, fracture classification, fluoroscopic imaging total time, and the post-graduate years (PGY) of orthopaedic residency of the operating resident.

Exclusions of patients included concomitant fluoroscopic procedures, inadequate records, or surgeries involving primary assisting residents with less than PGY-2 experience. We compared overall groups between half years and looked at individual resident years for each of the continuous variables.

RESULTS:
When residents were grouped as senior (PGY-4 and PGY-5) or junior (PGY-2 and PGY-3), seniors used significantly less fluoroscopy than juniors (207.39asec vs. 258.30asec, P=0.018). In the first half of the academic year, PGY-2 residents completed tibial nailing slowest in terms of fluoroscopic usage (P=0.003). PGY-4 residents completed tibial nailing faster in terms of fluoroscopic usage than other years (P=0.031). In the second half of the academic year, PGY-5 residents used significantly less fluoroscopy than PGY-2 residents (P=0.035).

CONCLUSIONS:
As the ACGME currently has no measurement for resident progress and efficiency regarding tibial shaft intramedullary nailing, our data indicate that fluoroscopic measurements may be useful in assessing resident proficiency.

Case-Based Simulation Empowering Pediatric Residents to Communicate about Diagnostic Uncertainty

Olson ME, Borman-Shoap E, Mathias K, Barnes TL, Olson APJ. Diagnosis (Berl). 2018 Nov 27;5(4): 243-248. doi: 10.1515/dx-2018-0025.

ABSTRACT:
Background Uncertainty is ubiquitous in medical practice. The Pediatrics Milestones from the Accreditation Council on Graduate Medical Education state that advanced learners should acknowledge and communicate about clinical uncertainty. If uncertainty is not acknowledged, patient care may suffer. There are no described curricula specifically aimed to improve learners' ability to acknowledge and discuss clinical uncertainty. We describe an educational intervention designed to fill this gap. Methods Second-year pediatric residents engaged in a two-phase simulation-based educational intervention designed to improve their ability to communicate about diagnostic uncertainty with patients and caregivers. In each phase, residents engaged in two simulated cases and debriefs. Performance was assessed after each simulated patient encounter using standardized metrics, along with learner perceptions of the experience. Results Residents' skills in communicating with patients and families about diagnostic uncertainty improved after this intervention (mean score post 3.84 vs. 3.28 pre on a five-point Likert scale, $p<0.001$). Residents rated the experience as relevant, challenging and positive. Conclusions This prospective study suggests that a simulation-based intervention was effective in improving resident physicians' skills in communicating about diagnostic uncertainty with patients and families. Further study is needed to determine how learners perform in real clinical environments.

Advancing Simulation-Based Education in Pain Medicine

Singh N, Nielsen AA, Copenhaver DJ, Sheth SJ, Li CS, Fishman SM. Pain Med. 2018 Sep 1;19(9):1725-1736. doi: 10.1093/pm/pnx344.

BACKGROUND:
The Accreditation Council for Graduate Medical Education (ACGME) has recently implemented milestones and competencies as a framework for training fellows in Pain Medicine, but individual programs are left to create educational platforms and assessment tools that meet ACGME standards.

OBJECTIVES:
In this article, we discuss the concept of milestone-based competencies and the inherent challenges for implementation in pain medicine. We consider simulation-based education (SBE) as a potential tool for the field to meet ACGME goals through advancing novel learning opportunities, engaging in clinically relevant scenarios, and mastering technical and nontechnical skills.

RESULTS:
The sparse literature on SBE in pain medicine is highlighted, and we describe our pilot experience, which exemplifies a nascent effort that encountered early difficulties in implementing and refining an SBE program.

CONCLUSIONS:
The many complexities in offering a sophisticated simulated pain curriculum that is valid, reliable, feasible, and acceptable to learners and teachers may only be overcome with coordinated and collaborative efforts among pain medicine training programs and governing institutions.

Long-Term Retention of Musculoskeletal Ultrasound Training during Residency

Irwin RW, Smith J, Issenberg SB. Am J Phys Med Rehabil. 2018 Jul;97(7):523-530. doi: 10.1097/PHM.0000000000000924.

ABSTRACT:
The Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Physical Medicine and Rehabilitation (ABPMR) developed milestones for evaluation of resident physicians that include proper musculoskeletal ultrasound (MSUS) examination of major joints. To date, there have been no published data demonstrating acquisition and retention of these skills and correlation with the milestone evaluation. The investigators developed and implemented a curriculum in musculoskeletal ultrasound examination for Physical Medicine and Rehabilitation (PM&R) residents at a large academic medical center. The investigators chose six joints for training and evaluation: ankle, elbow, hip, knee, shoulder and wrist/hand. The program included: 1) didactic lectures on anatomy and ultrasound technique; 2) peer-led demonstrations of the procedure on a standardized patient (SP); 3) individual practice on SPs; 4) faculty observation and feedback; 5) review sessions and additional practice; and, 6) assessment of skills in an objective structured clinical examination (OSCE). From 2013-2017, 30 PM&R residents were trained and evaluated. The results, based on OSCE scores, showed that the majority of residents achieved the appropriate level of competency for their year. A blended, standardized curriculum in MSUS instruction with assessment by an OSCE, can be used to evaluate MSUS skills, and can help align this education with residency milestones.

Comprehensive Health Care Economics Curriculum and Training in Radiology Residency

Keiper M, Donovan T, DeVries M. J Am Coll Radiol. 2018 Jun;15(6):900-904. doi: 10.1016/ j.jacr.2018.02.022. Epub 2018 May 2.

PURPOSE:
To investigate the ability to successfully develop and institute a comprehensive health care economics skills curriculum in radiology residency training utilizing didactic lectures, case scenario exercises, and residency mini retreats.

METHODS:
A comprehensive health care economics skills curriculum was developed to significantly expand upon the basic ACGME radiology residency milestone System-Based Practice, SBP2: Health Care Economics requirements and include additional education in business and contract negotiation, radiology sales and marketing, and governmental and private payers' influence in the practice of radiology.

RESULTS:
A health care economics curriculum for radiology residents incorporating three phases of education was developed and implemented. Phase 1 of the curriculum constituted basic education through didactic lectures covering System-Based Practice, SBP2: Health Care Economics requirements. Phase 2 constituted further, more advanced didactic lectures on radiology sales and marketing techniques as well as government and private insurers' role in the business of radiology. Phase 3 applied knowledge attained from the initial two phases to real-life case scenario exercises and radiology department business miniretreats with the remainder of the radiology department.

CONCLUSION:
A health care economics skills curriculum in radiology residency is attainable and essential in the education of future radiology residents in the ever-changing climate of health care economics.
Institution of more comprehensive programs will likely maximize the long-term success of radiology as a specialty by identifying and educating future leaders in the field of radiology.

Introducing a Curriculum in Ethics and Professionalism for Dermatology Residencies

Stoff BK, Grant-Kels JM, Brodell RT, Paller AS, Perlis CS, Mostow E, Pariser D, Bercovitch L. J Am Acad Dermatol. 2018 May;78(5):1032-1034. doi: 10.1016/j.jaad.2017.04.1121.

ABSTRACT:
There is general agreement on what constitutes ethical reasoning and professional behavior, but standardized methods to teach these skills in dermatology residency are currently unavailable. We introduce a model curriculum designed to impart the knowledge and skills to meet the Accreditation Council for Graduate Medical Education Dermatology Milestones for Professionalism over a 3-year cycle.

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.

Thresholds and Interpretations: How Clinical Competency Committees Identify Pediatric Residents with Performance Concerns

Schumacher DJ, Michelson C, Poynter S, Barnes MM, Li ST, Burman N, Sklansky DJ, Thoreson L, Calaman S, King B, Schwartz A; APPD LEARN CCC Study Group, Elliott S, Sharma T, Gonzalez Del Rey J, Bartlett K, Scott-Vernaglia SE, Gibbs K, McGreevy JF, Garfunkel LC, Gellin C, Frohna JG. Med Teach. 2018 Jan;40(1):70-79. doi: 10.1080/0142159X.2017.1394576.

BACKGROUND:
Clinical competency committee (CCC) identification of residents with performance concerns is critical for early intervention.

METHODS:
Program directors and 94 CCC members at 14 pediatric residency programs responded to a written survey prompt asking them to describe how they identify residents with performance concerns. Data was analyzed using thematic analysis.

RESULTS:
Six themes emerged from analysis and were grouped into two domains. The first domain included four themes, each describing a path through which residents could meet or exceed a concern threshold:1) written comments from rotation assessments are foundational in identifying residents with performance concerns, 2) concerning performance extremes stand out, 3) isolated data points may accumulate to raise concern, and 4) developmental trajectory matters. The second domain focused on how CCC members and program directors interpret data to make decisions about residents with concerns and contained 2 themes: 1) using norm- and/or criterion-referenced interpretation, and 2) assessing the quality of the data that is reviewed.

CONCLUSIONS:
Identifying residents with performance concerns is important for their education and the care they provide. This study delineates strategies used by CCC members across several programs for identifying these residents, which may be helpful for other CCCs to consider in their efforts.

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 postevent 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.

Appraising Medical Literature: The Effect of a Structured Journal Club Curriculum Using the Lancet Handbook of Essential Concepts in Clinical Research on Resident Self-Assessment and Knowledge in Milestone-Based Competencies

Lentscher JA, Batig AL. Mil Med. 2017 Nov;182(11):e1803-e1808. doi: 10.7205/MILMED-D-17-00059.

BACKGROUND:
Training in literature appraisal and statistical interpretation is one of the residency training requirements outlined by the Accreditation Council for Graduate Medical Education. Frequently, a journal club format is used to teach this competency although this teaching modality is not standardized or well studied in regard to its efficacy.

METHODS:
This study sought to determine the effect of a structured journal club curriculum that incorporated The Lancet Handbook of Essential Concepts in Clinical Research on objective and self-assessed knowledge pertaining to study design and interpretation. The study was a retrospective observational study evaluating the effect of a structured journal club curriculum using the Lancet text with pre- and postimplementation assessment using a resident self-assessment survey. The study examined a monthly journal club curriculum that covered 1 topic/chapter from the assigned text, paired with a contemporary article to highlight the chapter topic. Resident self-assessed and objective knowledge was evaluated and compared using a survey taken before and after the curriculum change. The study was completed during 1 academic year at Madigan Army Medical Center in Tacoma, Washington, an academic military medical training and tertiary care center. Study surveys were distributed to all 17 obstetrics and gynecology residents throughout the 4 residency training years. Of the 17 potential participants, 13 (76%) participated in the precurriculum assessment and 14 (82%) participated after its completion.

FINDINGS:
There was no significant improvement in resident self-assessed knowledge following curriculum implementation. There was a trend toward improved objective knowledge pertaining to study design and interpretation after curriculum completion, but this was not statistically significant.

DISCUSSION:
There is a lack of standardized and well-studied methods to teach residents how to evaluate and appraise medical literature and research. The Lancet Handbook of Essential Concepts in Clinical Research may be a useful tool to teach some of these tenets in the residency training environment, but this limited study did not prove this assertion.

IMPACT:
Three is a dearth of proven and well-studied means to teach the tenets of study design, statistical interpretation, and critical literature appraisal to trainees with any consistency or validity. This study demonstrated a trend toward better objective knowledge related to study design, interpretation, and understanding after a change in our training curriculum that implemented The Lancet Handbook of Essential Concepts in Clinical Research into the monthly journal club curriculum. Resident self-rated knowledge and proficiency in their abilities to understand research and study design were not significantly changed with the curriculum.

RECOMMENDATIONS:
Better evidence is needed to guide future educational curricula directed toward teaching the competency of medical literature review and appraisal.

A Competency-Based Simulation Curriculum for Surgical Resident Trauma Resuscitation Skills

Moorman ML, Capizzani TR, Feliciano MA, French JC. Int J Crit Illn Inj Sci. 2017 Oct- Dec;7(4):241-247. doi: 10.4103/IJCIIS.IJCIIS_12_17.

BACKGROUND:
Evidence-based curricula for nonprocedural simulation training in general surgery are lacking. Residency programs are required to implement simulation training despite this shortcoming. The goal of this project was the development of a simulation curriculum that measurably improves milestone performance and replaces traditional experienced-based training with a competency- based model.

MATERIALS AND METHODS:
SimMan 3G® (Laerdal Medical, Wappingers Falls, NY, USA) was utilized for simulation. Needs assessment targeted trauma and shock resuscitation. Scenario design applied deliberate practice methodology. Learner performance data included items such as identification of shock physiology, resuscitation products used, volume delivered, use of resuscitation end-points, and knowledge of massive transfusion. Characteristics essential for a successful program were tabulated.

RESULTS:
Forty-eight residents in postgraduate year (PGY) 2-5 participated representing 100% of the 48 eligible for the training. Senior residents (PGY 4 and 5) demonstrated near universal improvement. Junior residents (PGY 2 and 3) improved in some areas but showed more skill decay between sessions.
Overall, milestone performance improved with each training session, and resident feedback was universally positive.

CONCLUSIONS:
This prototype curriculum improved surgical resident competency in shock resuscitation in a simulated patient care environment. It can be modified to accommodate centers with fewer resources and can be implemented by clinical faculty. The essential characteristics of a successful program are identified.

Creation and Evaluation of a Laboratory Administration Curriculum for Pathology Residents

Guarner J; Hill C; Amukele, T. American Journal of Clinical Pathology. Oct 2017, Vol. 148 Issue 4, p368-373. 6p.

OBJECTIVES:
A clinical laboratory management (CLM) curriculum that can objectively assess the Accreditation Council for Graduate Medical Education pathology systems-based practice milestones and can provide consistent resident training across institutions is needed.

METHODS:
Faculty at Emory University created a curriculum that consists of assay verification exercises and interactive, case-based online modules. Beta testing was done at Emory University and Johns Hopkins. Residents were required to obtain a score of more than 80% in the online modules to achieve levels 3 to 4 in the milestones. In addition, residents shadowed a laboratory director, performed an inspection of a laboratory section, and completed training in human subjects research and test utilization.

RESULTS:
Fourteen residents took and evaluated the laboratory administration curriculum. The printed certificates from the modules were used for objective faculty evaluation of mastery of concepts. Of all the activities the residents performed during the rotation, the online modules were ranked most helpful by all residents. A 25-question knowledge assessment was performed before and after the rotation and showed an average increase of 8 points (P = .0001).

CONCLUSIONS:
The multimodal CLM training described here is an easily adoptable, objective system for teaching CLM. It was well liked by residents and provided an objective measurement of mastery of concepts for faculty.

Development of a Global Health Milestones Tool for Learners in Emergency Medicine: A Pilot Project

Douglass KA, Jacquet GA, Hayward AS, Dreifuss BA, Tupesis JP, Acerra J, Bloem C, Brenner J, DeVos E, Douglass K, Dreifuss B, Hayward AS, Hilbert SL, Jacquet GA, Lin J, Muck A, Nasser S, Oteng R, Powell NN, Rybarczyk MM, Schmidt J, Svenson J, Tupesis JP, Yoder K. AEM Educ Train. 2017 Sep 11;1(4):269-279. doi: 10.1002/aet2.10046. eCollection 2017 Oct.

OBJECTIVES:
In medical education and training, increasing numbers of institutions and learners are participating in global health experiences. Within the context of competency-based education and assessment methodologies, a standardized assessment tool may prove valuable to all of the aforementioned stakeholders. Milestones are now used as the standard for trainee assessment in graduate medical education. Thus, the development of a similar, milestone- based tool was undertaken, with learners in emergency medicine (EM) and global health in mind.

METHODS:
The Global Emergency Medicine Think Tank Education Working Group convened at the 2016 Society for Academic Medicine Annual Meeting in New Orleans, Louisiana. Using the Interprofessional Global Health Competencies published by the Consortium of Universities for Global Health's Education Committee as a foundation, the working group developed individual milestones based on the 11 stated domains. An iterative review process was implemented by teams focused on each domain to develop a final product.

RESULTS:
Milestones were developed in each of the 11 domains, with five competency levels for each domain. Specific learning resources were identified for each competency level and assessment methodologies were aligned with the milestones framework. The Global Health Milestones Tool for learners in EM is designed for continuous usage by learners and mentors across a career.

CONCLUSIONS:
This Global Health Milestones Tool for learners in EM may prove valuable to numerous stakeholders. The next steps include a formalized pilot program for testing the tool's validity and usability across training programs, as well as an assessment of perceived utility and applicability by collaborating colleagues working in training sites abroad.

A Taxonomy of Perioperative Surgical Learning: Trending Resident Skill Acquisition

Hardaway JC, Basson MD2, Ali M, Davis AT, Haan PS, Gupta RN, Peshkepija AN, Nebeker CA, McLeod MK, Osmer RL, Anderson CI; MSU GOAL Consortium. Am J Surg. 2017 Feb;213(2):260-267. doi: 10.1016/ j.amjsurg. 2016.09.045. Epub 2016 Oct 8.

BACKGROUND:
Resident and curriculum evaluation require tracking surgical resident operative performance, yet what and when to measure remains unclear.

METHODS:
From a multi-institutional database, we reviewed 611 resident/surgeon-paired assessments of ACGME Milestones and modified OPRS ratings for different cases and postgraduate years.

RESULTS:
Faculty Milestone ratings increased with each PGY (p=<0.001) and correlated with resident self- ratings (ICC = 0.83). Mean OPRS scores increased in small increments with substantial intra-year variability. Progression among individual OPRS subcategories was not apparent from more global analyses.
Interestingly, male faculty offered lower ratings than female faculty.

CONCLUSIONS:
Milestones and modified mean OPRS ratings suggest residents are learning, yet lack sufficient discrimination for promotion or curricular analysis. Differential progression through OPRS subcategories suggests a taxonomy of surgical learning that can be tailored to focus on different skills at each point in the training continuum. The effect of faculty gender on resident ratings awaits further study.

Milestone Assessment of Minimally Invasive Surgery in Pediatric UrologyFellowship Programs

Smith PH 3rd, Carpenter M, Herbst KW, Kim C. J Pediatr Urol. 2017 Feb;13(1):110.e1-110.e6. doi: 10.1016/j.jpurol.2016.08.012. Epub 2016 Sep 15

INTRODUCTION:
Minimally invasive surgery has become an important aspect of Pediatric Urology fellowship training. In 2014, the Accreditation Council for Graduate Medical Education published the Pediatric Urology Milestone Project as a metric of fellow proficiency in multiple facets of training, including laparoscopic/roboticprocedures.

OBJECTIVE:
The present study assessed trends in minimally invasive surgery training and utilization of the Milestones among recent Pediatric Urology fellows.

STUDY DESIGN:
Using an electronic survey instrument, Pediatric Urology fellowship program directors and fellows who completed their clinical year in 2015 were surveyed. Participants were queried regarding familiarity with the Milestone Project, utilization of the Milestones, robotic/laparoscopic case volume and training experience, and perceived competency with robotic/laparoscopic surgery at the start and end of the fellowship clinical year according to Milestone criteria. Responses were accepted between August and November 2015.

RESULTS:
Surveys were distributed via e-mail to 35 fellows and 30 program directors. Sixteen fellows (46%) and 14 (47%) program directors responded. All fellows reported some robotic experience prior to fellowship, and 69% performed >50 robotic/laparoscopic surgeries during residency. Fellow robotic/laparoscopic case volume varied: three had 1-10 cases (19%), four had 11-20 cases (25%), and nine had >20 cases (56%). Supplementary or robotic training modalities included simulation (9), animal models (6), surgical videos (7), and courses (2). Comparison of beginning and end of fellowship robotic/laparoscopic Milestone assessment (Summary Fig.) revealed scores of <3 in (10) 62% of fellow self-assessments and 10 (75%) of program director assessments. End of training Milestone scores >4 were seen in 12 (75%) of fellow self- assessment and eight (57%) of program director assessments.

DISCUSSION:
An improvement in robotic/laparoscopic Milestone scores by both fellow self-assessment and program director assessment was observed during the course of training; however, 43% of program directors rated their fellow below the graduation target of a Milestone score of 4.

CONCLUSION:
The best ways to teach minimally invasive surgery in fellowship training must be critically considered.

Practical Implications for an Effective Radiology Residency Quality Improvement Program for Milestone Assessment

Leddy R, Lewis M, Ackerman S, Hill J, Thacker P, Matheus M, Tipnis S, Gordon L. Acad Radiol. 2017 Jan;24(1):95-104. doi: 10.1016/j.acra.2016.08.018. Epub 2016 Oct 18.

ABSTRACT:
Utilization of a radiology resident-specific quality improvement (QI) program and curriculum based on the Accreditation Council for Graduate Medical Education (ACGME) milestones can enable a program's assessment of the systems-based practice component and prepare residents for QI implementation post graduation. This article outlines the development process, curriculum, QI committee formation, and resident QI project requirements of one institution's designated radiology resident QI program. A method of mapping the curriculum to the ACGME milestones and assessment of resident competence by postgraduate year level is provided. Sample projects, challenges to success, and lessons learned are also described. Survey data of current trainees and alumni about the program reveal that the majority of residents and alumni responders valued the QI curriculum and felt comfortable with principles and understanding of QI. The most highly valued aspect of the program was the utilization of a resident education committee. The majority of alumni responders felt the residency quality curriculum improved understanding of QI, assisted with preparation for the American Board of Radiology examination, and prepared them for QI in their careers. In addition to the survey results, outcomes of resident project completion and resident scholarly activity in QI are evidence of the success of this program. It is hoped that this description of our experiences with a radiology resident QI program, in accordance with the ACGME milestones, may facilitate the development of successful QI programs in other diagnostic radiology residencies.

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.

Making Milestones: Development and Implementation of a Formal Socioeconomic Curriculum in a Neurosurgical Residency Training Program

Youngerman BE, Zacharia BE, Hickman ZL, Bruce JN, Solomon RA, Benzil DL. Neurosurgery. 2016 Sep;79(3): 492-8. doi: 10.1227/NEU.0000000000001126.

BACKGROUND:
Improved training in the socioeconomic aspects of medicine is a priority of the Accreditation Council for Graduate Medical Education and the American Board of Neurological Surgeons. There is evidence that young neurosurgeons feel ill equipped in these areas and that additional education would improve patient care.

OBJECTIVE:
To present our experience with the introduction of a succinct but formal socioeconomic training course to the residency curriculum at our institution.

METHODS:
A monthly series of twelve 1-hour interactive modules was designed to address the pertinent Accreditation Council for Graduate Medical Education-American Board of Neurological Surgeons outcomes-based educational milestones. Slide-based lectures provided a comprehensive overview of social, legal, and business issues, and a monthly forum for open discussion allowed residents to draw on their applied experience. Residents took a 20-question pre- and postcourse knowledge assessment, as well as feedback surveys at 6 and 12 months.

RESULTS:
Residents were able to participate in the lectures, with an overall attendance rate of 91%. Residents felt that the course goals and objectives were well defined and communicated (4.88/5) and rated highly the content, quality, and relevance of the lectures (4.94/5). Performance on the knowledge assessment improved from 58% to 66%.

CONCLUSION:
Our experience demonstrates the feasibility of including a formal socioeconomic course in neurosurgical residency training with positive resident feedback and achievement of outcomes- based milestones. Extension to a 2-year curriculum cycle may allow the course to cover more material without compromising other residency training goals. Online modules should also be explored to allow for wider and more flexible participation.

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.

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

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

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

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

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

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

Have First-Year Emergency Medicine Residents Achieved Level 1 on Care-Based Milestones?

Weizberg M, Bond MC, Cassara M, Doty C, Seamon J. J Grad Med Educ. 2015 Dec;7(4):589-94

BACKGROUND:
Residents in Accreditation Council for Graduate Medical Education accredited emergency medicine (EM) residencies were assessed on 23 educational milestones to capture their progression from medical student level (Level 1) to that of an EM attending physician (Level 5). Level 1 was conceptualized to be at the level of an incoming postgraduate year (PGY)-1 resident; however, this has not been confirmed.

OBJECTIVES:
Our primary objective in this study was to assess incoming PGY-1 residents to determine what percentage achieved Level 1 for the 8 emergency department (ED) patient care-based milestones (PC 1- 8), as assessed by faculty. Secondary objectives involved assessing what percentage of residents had achieved Level 1 as assessed by themselves, and finally, we calculated the absolute differences between self- and faculty assessments.

METHODS:
Incoming PGY-1 residents at 4 EM residencies were assessed by faculty and themselves during their first month of residency. Performance anchors were adapted from ACGME milestones.

RESULTS:
Forty-one residents from 4 programs were included. The percentage of residents who achieved Level 1 for each subcompetency on faculty assessment ranged from 20% to 73%, and on self-assessment from 34% to 92%. The majority did not achieve Level 1 on faculty assessment of milestones PC-2, PC-3,
PC-5a, and PC-6, and on self-assessment of PC-3 and PC-5a. Self-assessment was higher than faculty assessment for PC-2, PC-5b, and PC-6.

CONCLUSIONS:
Less than 75% of PGY-1 residents achieved Level 1 for ED care-based milestones. The majority did not achieve Level 1 on 4 milestones. Self-assessments were higher than faculty assessments for several milestones.

Gearing Up for Milestones in Surgery: Will Simulation Play a Role?

Gardner AK, Scott DJ, Hebert JC, Mellinger JD, Frey-Vogel A, Ten Eyck RP, Davis BR, Sillin LF 3rd, Sachdeva AK. Surgery. 2015 Nov;158(5):1421-7. doi: 10.1016/j.surg.2015.03.039. Epub 2015 May 23.

BACKGROUND:
The Consortium of American College of Surgeons-Accredited Education Institutes was created to promote patient safety through the use of simulation, develop new education and technologies, identify best practices, and encourage research and collaboration.

METHODS:
During the 7th Annual Meeting of the Consortium, leaders from a variety of specialties discussed how simulation is playing a role in the assessment of resident performance within the context of the Milestones of the Accreditation Council for Graduate Medical Education as part of the Next Accreditation System.

CONCLUSION:
This report presents experiences from several viewpoints and supports the utility of simulation for this purpose.

Fostering and Assessing Professionalism and Communication Skills in Neurosurgical Education

Fontes RB, Selden NR, Byrne RW. J Surg Educ. 2014 Nov-Dec;71(6):e83-9. doi: 10.1016/ j.jsurg.2014.06.016. Epub 2014 Aug 29.

INTRODUCTION:
Incorporation of the 6 ACGME core competencies into surgical training has proven a considerable challenge particularly for the two primarily behavioral competencies, professionalism and interpersonal and communication skills. We report on experience with two specific interventions to foster the teaching and continuous evaluation of these competencies for neurosurgery residents.

MATERIAL AND METHODS:
In 2010, the Society of Neurological Surgeons (SNS) organized the first comprehensive Neurosurgery Boot Camp courses, held at six locations throughout the US and designed to assess and teach not only psychomotor skills but also components of all six Accreditation Council for Graduate Medical Education (ACGME) core competencies. These courses are comprised of various educational methodologies, including online material, faculty lectures, clinical scenario and group discussions, manual skills stations, and pre- and post-course assessments. Resident progress in each of the 6 ACGME competencies is now tracked using the neurosurgical Milestones, developed by the ACGME in collaboration with the SNS. In addition, the Milestones drafting group for neurosurgery has formulated a milestone-compatible evaluation system to directly populate Milestone reports. These evaluations utilize formative, summative, and 360-degree evaluations that are considered by a faculty core competency committee in finalizing milestones levels for each resident.

RESULTS:
Initial attendance at the 2010 Boot Camp course was 94% of the incoming resident class and in subsequent years, 100%. Pre- and post-course surveys demonstrated a significant and sustained increase in knowledge. The value of these courses has been recognized by the ACGME, which requires Boot Camp or equivalent participation prior to acting with indirect supervision during clinical activities. Neurosurgery was one of 7 early Milestone adopter specialties, beginning use in July, 2013. Early milestone data will establish benchmarks prior to utilization for "high stake" decisions such as promotion, graduation, and termination.

CONCLUSIONS:
The full impact of the neurosurgical Boot Camps and Milestones on residency education remains to be measured, although published data from the first years of the Boot Camp Courses demonstrate broad acceptance and early effectiveness. A complementary junior resident course has now been introduced for rising second-year residents. The Milestones compatible evaluation system now provides for multi- source formative and summative evaluation of neurosurgical residents within the new ACGME reporting rubric. Combined with consensus milestone assignments, this system provides new specificity and objectivity to resident evaluations. The correlation of milestone level assignments with other measurements of educational outcome awaits further study.

Entrustable Professional Activities and Curricular Milestones for Fellowship Training in Pulmonary and Critical Care Medicine: Report of a Multisociety Working Group

Fessler HE, Addrizzo-Harris D, Beck JM, Buckley JD, Pastores SM, Piquette CA, Rowley JA, Spevetz A. Chest. 2014 Sep;146(3):813-834. doi: 10.1378/chest.14-0710.

ABSTRACT:
This article describes the curricular milestones and entrustable professional activities for trainees in pulmonary, critical care, or combined fellowship programs. Under the Next Accreditation System of the Accreditation Council for Graduate Medical Education (ACGME), curricular milestones compose the curriculum or learning objectives for training in these fields. Entrustable professional activities represent the outcomes of training, the activities that society and professional peers can expect fellowship graduates to be able to perform unsupervised. These curricular milestones and entrustable professional activities are the products of a consensus process from a multidisciplinary committee of medical educators representing the American College of Chest Physicians (CHEST), the American Thoracic Society, the Society of Critical Care Medicine, and the Association of Pulmonary and Critical Care Medicine Program Directors. After consensus was achieved using the Delphi process, the document was revised with input from the sponsoring societies and program directors. The resulting lists can serve as a roadmap and destination for trainees, program directors, and educators. Together with the reporting milestones, they will help mark trainees' progress in the mastery of the six ACGME core competencies of graduate medical education.

Teaching Ultrasound Professionalism

Hashimoto BE, Kasales C, Wall D, McDowell J, Lee M, Hamper UM. Ultrasound Q. 2014 Jun;30(2):91-5. doi: 10.1097/RUQ.0000000000000063.

ABSTRACT:
Professionalism is part of the milestone program instituted by the Accreditation Council for Graduate Medical Education and the American Board of Radiology. A unique feature of ultrasound professionalism is the relationship between the radiologist and the sonographer. Because this relationship is important for sonographic quality and ultimately patient outcome, residents should be trained to achieve an optimal professional relationship with sonographers. This article describes milestones for ultrasound professionalism and suggests methods of implementation.

Playing with Curricular Milestones in the Educational Sandbox: Q-Sort Results from an Internal Medicine Educational Collaborative

Meade LB, Caverzagie KJ, Swing SR, Jones RR, O'Malley CW, Yamazaki K, Zaas AK. Acad Med. 2013 Aug;88(8):1142-8. doi: 10.1097/ACM.0b013e31829a3967.

PURPOSE:
In competency-based medical education, the focus of assessment is on learner demonstration of predefined outcomes or competencies. One strategy being used in internal medicine (IM) is applying curricular milestones to assessment and reporting milestones to competence determination. The authors report a practical method for identifying sets of curricular milestones for assessment of a landmark, or a point where a resident can be entrusted with increased responsibility.

METHOD:
Thirteen IM residency programs joined in an educational collaborative to apply curricular milestones to training. The authors developed a game using Q-sort methodology to identify high-priority milestones for the landmark "Ready for indirect supervision in essential ambulatory care" (EsAMB). During May to December 2010, the programs' ambulatory faculty participated in the Q-sort game to prioritize 22 milestones for EsAMB. The authors analyzed the data to identify the top 8 milestones.

RESULTS:
In total, 149 faculty units (1-4 faculty each) participated. There was strong agreement on the top eight milestones; six had more than 92% agreement across programs, and five had 75% agreement across all faculty units. During the Q-sort game, faculty engaged in dynamic discussion about milestones and expressed interest in applying the game to other milestones and educational settings.

CONCLUSIONS:
The Q-sort game enabled diverse programs to prioritize curricular milestones with interprogram and interparticipant consistency. A Q-sort exercise is an engaging and playful way to address milestones in medical education and may provide a practical first step toward using milestones in the real-world educational setting.

Applying the Milestones in an Internal Medicine Residency Program Curriculum: A Foundation for Outcomes-Based Learner Assessment under the Next Accreditation System

Lowry BN, Vansaghi LM, Rigler SK, Stites SW. Acad Med. 2013 Nov;88(11):1665-9. doi: 10.1097/ACM.0b013e3182a8c756.

ABSTRACT:
In 2010, University of Kansas Medical Center internal medicine residency program leaders concluded that their competency-based curriculum and evaluation system was not sufficient to promote accurate assessment of learners' performance and needed revision to meet the requirements of the Accreditation Council for Graduate Medical Education (ACGME) Next Accreditation System (NAS). Evaluations of learners seldom referenced existing curricular goals and objectives and reflected an "everyone is exceptional, no one is satisfactory" view. The authors identified the American Board of Internal Medicine and ACGME's Developmental Milestones for Internal Medicine Residency Training as a published standard for resident development. They incorporated the milestones into templates, a format that could be modified for individual rotations. A milestones-based curriculum for each postgraduate year of training and every rotation was then created, with input from educational leaders within each division in the Department of Internal Medicine and with the support of the graduate medical education office. In this article, the authors share their implementation process, which took approximately one year, and discuss their current work to create a documentation system for direct observation of entrustable professional activities, with the aim of providing guidance to other programs challenged with developing an outcomes-based curriculum and assessment system within the time frame of the NAS.

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.