



# **Polycymakers - Impact of Milestones**

## **Advancing Fellowship Training in Selective Pathology**

Hagemann IS, Elliott R, Kalof A, Keung ES, Patil N, Peterson JEG. Arch Pathol Lab Med. 2022 Apr 1;146(4):501-506. doi: 10.5858/arpa.2021-0112-OA. PMID: 34324625.

### **Context:**

Program requirements for Selective Pathology fellowships in the United States were established by the Accreditation Council for Graduate Medical Education (ACGME) in 2011 to govern fellowships providing advanced training in surgical pathology, focused anatomic pathology, or focused clinical pathology. Selective Pathology entered the ACGME's Next Accreditation System in 2015 with the introduction of the Selective Pathology Milestones 1.0, a set of benchmarks for evaluating fellow progress in each of the 6 ACGME core competencies. In 2019, the ACGME convened a work group for a planned periodic update to these milestones.

### **Objective:**

To summarize changes to the Selective Pathology milestones.

### **Design:**

The study design featured expert opinion and survey.

### **Results:**

The Patient Care milestones for anatomic pathology-focused fellowships contain a renewed emphasis on both gross and microscopic examination, whereas for clinical pathology-focused fellowships, the emphasis is on interpretation of laboratory assays. The milestones for the non-Patient Care, non-Medical Knowledge competencies have been updated to a harmonized set of milestones designed to extend across all specialties and subspecialties. New to the milestones program is a supplemental guide that provides examples, suggested assessment tools, and references to aid in implementation. Public comments were supportive of the changes.

### **Conclusions:**

The Milestones 2.0 are set for implementation in July 2021. Updates in the new milestones are aimed at facilitating training and harmonizing evaluation across subspecialties.

**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.

**ACGME Diagnostic Radiology Milestones 2.0: the Time is Now**

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

**ABSTRACT:**

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

**Communication Skills of Grandview/Southview Medical Center General Surgery Residents**

Johnson W, Ngo NA, Elrod M. J Am Osteopath Assoc. 2020 Dec 1;120(12):865-870. doi: 10.7556/jaoa.2020.122. PMID: 33227127.

**CONTEXT:**

In the transition of osteopathic programs to the single-accreditation graduate medical education (GME) system, residents are required to demonstrate skill in a set of core competencies identified by the Accreditation Council of Graduate Medical Education (ACGME) prior to graduation. Included in those core competencies are interpersonal and communication skills along with professionalism.

**OBJECTIVES:**

To assess strengths and weaknesses of residents' interpersonal communication skills and professionalism in the Grandview/Southview Medical Center (Dayton, OH) osteopathic general surgery program using the validated Communication Assessment Tool (CAT).

**METHODS:**

From November 2014 to June 2018, all patients who presented for an appointment at the Cassano General Surgery Clinic were asked by a medical assistant to complete a CAT questionnaire following their encounter with a resident physician. Patients at Cassano, an outpatient office-based facility directed to the underserved local community, are seen first by an intern, then by a 4th or 5th year resident and later by an attending physician. Patients 18 years of age or older were included; patients were excluded if they were unable to understand or read English. Patient demographics were collected, including age, gender, race/ethnicity, and previous exposure to this resident physician. Each resident's name was replaced on the CAT with a number for data analysis. The resident variables collected for this study included year of training, gender, and native language.

**RESULTS:**

The mean response for all CAT items was 4.5 out of 5, indicating that responses to resident performance were largely positive. Patients responded to 4 of the 14 CAT items with only excellent, very good, or good responses and no fair or poor responses. Four items had only 1 fair or poor response. The remaining 6 items received more than 1 fair or poor response: "greeted me in a way that made me feel comfortable" (#1), "talked in terms I could understand" (#8), "encouraged me to ask questions" (#10), "involved me in decisions as much as I wanted" (#11), "showed care and concern" (#13), and "spent the right amount of time with me" (#14).

**CONCLUSIONS:**

Attending surgeons evaluate residents in multiple areas from a doctor's perspective, but there is a potential lack of correlation between that evaluation and a patient's experience, which is paramount in osteopathic medicine. Patient responses to the CAT questionnaire can be used by program directors to identify deficiencies in milestone/competency achievement and facilitate improvement both individually and programmatically for residents according to ACGME standards.

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

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

**OBJECTIVE:**

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

**METHODS:**

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

**RESULTS:**

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

**CONCLUSIONS:**

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

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

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

#### **PURPOSE OF REVIEW:**

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

#### **RECENT FINDINGS:**

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

**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.



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

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

**ABSTRACT:**

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

**Improving Our Ability to Predict Resident Applicant Performance: Validity Evidence for a Situational Judgment Test**

Cullen MJ, Zhang C, Marcus-Blank B, Braman JP, Tiryaki E, Konia M, Hunt MA, Lee MS, Heest AV, Englander R, Sackett PR, Andrews JS. Teach Learn Med. 2020 May 19;1-14. doi: 10.1080/10401334.2020.1760104.

**CONSTRUCT:**

We investigated whether a situational judgment test (SJT) designed to measure professionalism in physicians predicts residents' performance on (a) Accreditation Council for Graduate Medical Education (ACGME) competencies and (b) a multisource professionalism assessment (MPA).

**BACKGROUND:**

There is a consensus regarding the importance of assessing professionalism and interpersonal and communication skills in medical students, residents, and practicing physicians. Nonetheless, these noncognitive competencies are not well measured during medical education selection processes. One promising method for measuring these noncognitive competencies is the SJT. In a typical SJT, respondents are presented with written or video-based scenarios and asked to make choices from a set of alternative courses of action. Interpersonally oriented SJTs are commonly used for selection to medical schools in the United Kingdom and Belgium and for postgraduate selection of trainees to medical practice in Belgium, Singapore, Canada, and Australia. However, despite international evidence suggesting that SJTs are useful predictors of in-training performance, end-of-training performance, supervisory ratings of performance, and clinical skills licensing objective structured clinical examinations, the use of interpersonally oriented SJTs in residency settings in the United States has been infrequently investigated. The purpose of this study was to investigate whether residents' performance on an SJT designed to measure professionalism-related competencies—conscientiousness, integrity, accountability, aspiring to excellence, teamwork, stress tolerance, and patient-centered care—predicts both their current and future performance as residents on two important but conceptually distinct criteria: ACGME competencies and the MPA.

**APPROACH:**

We developed an SJT to measure seven dimensions of professionalism. During calendar year 2017, 21 residency programs from 2 institutions administered the SJT. We conducted analyses to determine the validity of SJT and USMLE scores in predicting milestone performance in ACGME core competency domains and the MPA in June 2017 and 3 months later in September 2017 for the MPA and 1 year later, in June 2018, for ACGME domains.

**RESULTS:**

At both periods, the SJT score predicted overall ACGME milestone performance ( $r = .13$  and  $.17$ , respectively;  $p < .05$ ) and MPA performance ( $r = .19$  and  $.21$ , respectively;  $p < .05$ ). In addition, the SJT predicted ACGME patient care, systems-based practice, practice-based learning and improvement, interpersonal and communication skills, and professionalism competencies ( $r = .16$ ,  $.15$ ,  $.15$ ,  $.17$ , and  $.16$ , respectively;  $p < .05$ ) 1 year later. The SJT score contributed incremental validity over USMLE scores in predicting overall ACGME milestone performance ( $\Delta R = .07$ ) 1 year later and MPA performance ( $\Delta R = .05$ ) 3 months later.

**CONCLUSIONS:**

SJTs show promise as a method for assessing noncognitive attributes in residency program applicants. The SJT's incremental validity to the USMLE series in this study underscores the importance of moving beyond these standardized tests to a more holistic review of candidates that includes both cognitive and noncognitive measures.

**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.

**Advancing Competency-Based Medical Education Through Assessment and Feedback in Breast Imaging**

Anna I Holbrook, Claudia Kasales . 2020 Mar;27(3):442-446. doi: 10.1016/j.acra.2019.04.017. Epub 2019 May 27.

**ABSTRACT:**

Competency-based medical education (CBME) is a method of educating and assessing trainees that focuses on outcomes, rather than process. In this review, we inform radiologists involved in breast imaging training on the tenets of CBME and its relationship to the milestones, feedback and assessment. We also describe multiple methods for assessment specific to the breast imaging curriculum, and techniques for improving feedback to trainees in breast imaging.

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

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

**ABSTRACT:**

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

**Trends in United States Neurosurgery Residency Education and Training over the Last Decade (2009-2019)**

Yaeger KA, Munich SA, Byrne RW, Germano IM. *Neurosurg Focus*. 2020 Mar 1;48(3):E6. doi: 10.3171/2019.12.FOCUS19827.

**OBJECTIVE:**

Postgraduate training in medicine has been under scrutiny in the last 10 years, with a focus on improving residents' education. The aim of this study was to quantify trends in neurosurgery residency (NSR) training and education over the last 10 years.

**METHODS:**

The authors assessed Accreditation Council for Graduate Medical Education (ACGME), National Resident Matching Program, and American Board of Neurological Surgeons records and searched PubMed to collate 2009-2019 data. Analyzed trends included residents' demographic data, programs' characteristics, graduation and attrition rates, match data, resident case logs, and qualitative educational curriculum changes.

**RESULTS:**

Significant increases in residents' demographic data ( $p < 0.05$ ) included the number of female residents (from 12.7% to 17.6%) and the absolute number of residents (from 1112 to 1462). Age (mean 28.8 years), ethnicity, and number of residents per program (mean 13 residents per program) were unchanged. There were 16 new ACGME NSR programs, with currently 115 programs nationwide. The number of applicants per year (324 applicants per year) and the matching rate (mean 64%) remained stable. The mean attrition rate of 2.6% (range 2%-4%) was higher than the mean 2.1% ACGME attrition rate, a rate that decreased from 3% in 2009 to 1.6% in 2019. Education curriculum changes aimed at the standardization of training across the US included residents' boot camp (2009), the Milestones project (2012), and mandatory 7-year training initiated in 2013. An increase in endovascular, functional, trauma, and spine resident caseload was noted. The number of yearly publications about US NSR education has significantly increased ( $p < 0.05$ ).

**CONCLUSIONS:**

NSR education has received greater attention over the last decade in the US. Standardization of training has been implemented. A steady number of students remain interested in neurosurgery, with an increased number of women entering the field. Attention to wellness, in addition to high-quality education, should be further assessed as a factor to improve the overall NSR training and retention rate.

## **Comparison of Male and Female Resident Milestone Assessments During Emergency Medicine Residency Training: A National Study**

Santen SA, Yamazaki K, Holmboe ES, Yarris LM, Hamstra SJ. Acad Med. 2020 Feb;95(2):263-268. doi: 10.1097/ACM.0000000000002988.

### **PURPOSE:**

A previous study found that milestone ratings at the end of training were higher for male than female residents in emergency medicine (EM). However, that study was restricted to a sample of 8 EM residency programs, and used individual faculty ratings from milestone reporting forms that were designed for use by the program's Clinical Competency Committee (CCC). The objective of this study was to investigate whether similar results would be found when examining the entire national cohort of EM milestone ratings reported by programs after CCC consensus review.

### **METHOD:**

This study examined longitudinal milestone ratings for all EM residents (n = 1,363; 125 programs) reported to the Accreditation Council for Graduate Medical Education every 6 months from 2014- 2017. A multilevel linear regression model was used to estimate differences in slope for all subcompetencies, and predicted marginal means between genders were compared at time of graduation.

### **RESULTS:**

There were small but statistically significant differences between males' and females' increase in ratings from initial rating to graduation on 6 of the 22 subcompetencies. Marginal mean comparisons at time of graduation demonstrated gender effects for 4 patient care subcompetencies. For these subcompetencies, males were rated as performing better than females; differences ranged from 0.048 to 0.074 milestone ratings.

### **CONCLUSIONS:**

In this national dataset of EM resident milestone assessments by CCCs, males and females were rated similarly at the end of their training for the majority of subcompetencies. Statistically significant but small absolute differences were noted in 4 patient care subcompetencies.

**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.



**Content Analysis of Family Medicine Resident Peer Observations**

Page C, Reid A, Brown MM, Baker HM, Coe C, Myerholtz L. *Fam Med.* 2020 Jan;52(1):43-47. doi: 10.22454/FamMed.2020.855292

**BACKGROUND AND OBJECTIVES:**

Direct observation is a critical part of assessing learners' achievement of the Accreditation Council for Graduate Medical Education (ACGME) Milestones and subcompetencies. Little research exists identifying the content of peer feedback among residents; this study explored the content of residents' peer assessments as they relate to ACGME Milestone subcompetencies in a family medicine residency program.

**METHODS:**

Using content from a mobile app-based observation tool (M3App), we examined resident peer observations recorded between June 2014 and November 2017, tabulating frequency of observation for each ACGME subcompetency and calculating the proportion of observations categorized under each subcompetency, as well as for each postgraduate year (PGY) class. We also coded each observation on three separate dimensions: "positive," "constructive," and "actionable." We used the  $\chi^2$  test for independence, and estimated odds ratios and 95% confidence intervals for two-by-two comparisons to compare numbers of observations within each category.

**RESULTS:**

Our data include 886 peer observations made by 54 individual residents. The most frequently observed competencies were in patient care, communication, and professionalism (56%, 47%, and 38% of observations, respectively). Practice-based learning and improvement was observed least frequently (16% of observations). On average, 97.25% of the observations were positive, 85% were actionable, and 6% were constructive.

**CONCLUSIONS:**

When asked to review their peers, residents provide comments that are primarily positive and actionable. In addition, residents tend to provide more feedback on certain subcompetencies compared to others, suggesting that programs may rely on peer feedback for specific subcompetencies. Peers can provide perspective on the behaviors and skills of fellow residents.

## **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.

**Orthopaedic Surgery Residency Milestones: Initial Formulation and Future Directions**

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

**ABSTRACT:**

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

## **Using Longitudinal Milestones Data and Learning Analytics to Facilitate the Professional Development of Residents: Early Lessons from Three Specialties**

Holmboe ES, Yamazaki K, Nasca TJ, Hamstra SJ. Acad Med. 2020 Jan;95(1):97-103. doi: 10.1097/ACM.0000000000002899.

### **PURPOSE:**

To investigate the effectiveness of using national, longitudinal milestones data to provide formative assessments to identify residents at risk of not achieving recommended competency milestone goals by residency completion. The investigators hypothesized that specific, lower milestone ratings at earlier time points in residency would be predictive of not achieving recommended Level (L) 4 milestones by graduation.

### **METHOD:**

In 2018, the investigators conducted a longitudinal cohort study of emergency medicine (EM), family medicine (FM), and internal medicine (IM) residents who completed their residency programs from 2015 to 2018. They calculated predictive values (PVs) and odds ratios (ORs), adjusting for nesting within programs, for specific milestone rating thresholds at 6-month intervals for all subcompetencies within each specialty. They used final milestone ratings (May/June 2018) as the outcome variables, setting L4 as the ideal educational outcome.

### **RESULTS:**

The investigators included 1,386 (98.9%) EM residents, 3,276 (98.0%) FM residents, and 7,399 (98.0%) IM residents in their analysis. The percentage of residents not reaching Level 4 by graduation ranged from 11-31% in EM, 16-53% in FM, and 5-15% in IM. Using a milestone rating of Level 2.5 or lower at the end of PGY2, the predictive probability of not attaining the L4 milestone graduation goal ranged from 32-56% in EM, 32-67% in FM, and 15-36% in IM.

### **CONCLUSIONS:**

Longitudinal milestones ratings may provide educationally useful, predictive information to help individual residents address potential competency gaps, but the predictive power of the milestones ratings varies by specialty and subcompetency within these three adult care specialties.

**Utility of Residency Milestones Reported to Fellowship Directors: A National Survey of Pediatric Fellowship Program Directors**

Reed S, Mink R, Li ST. Acad Pediatr. 2020 Jan 21. pii: S1876-2859(20)30005-X. doi: 10.1016/j.acap.2020.01.004. [Epub ahead of print]

**BACKGROUND:**

The Accreditation Council for Graduate Medical Education (ACGME) requires milestone-based assessments of residents and fellows. The ACGME recently allowed fellowship programs access to the final residency milestones for incoming fellows through the ACGME Accreditation Data System. It is unknown if fellowship programs are downloading residency milestones and if fellowship program directors (FPDs) believe they have value.

**OBJECTIVE:**

Determine how many pediatric FPDs downloaded residency milestones and FPD perspectives on usefulness of residency milestones for first-year fellows.

**METHODS:**

Cross-sectional survey of pediatric FPDs in the US, with assistance from the Subspecialty Pediatrics Investigator Network (SPIN) Steering Committee. Respondents were asked whether they downloaded residency milestones and their programs' specific use of these milestones for their first-year fellows. FPDs were asked open-ended questions about why residency milestones were or were not useful, how they could be more useful, and if they would be useful in recruitment. Descriptive statistics were used to explore quantitative data and content analysis was used to analyze qualitative data.

**RESULTS:**

66.5% (532/800) of FPDs responded, representing all 14 pediatric subspecialties. Most programs (60.7%; 323/532) did not download residency milestones for their first-year fellows. Of these, 67.5% (218/323) did not know they could. Of FPDs that downloaded and reviewed residency milestones, only 27% (50/185) used them for individualized education. Only 24% (129/532) of all FPDs thought residency milestones were useful or very useful. 41% (218/532) thought residency milestones would be useful or very useful during recruitment, but some believed this may harm applicants. FPDs felt residency milestones allowed for identification of trainee needs and baseline assessments, but felt that these milestones had limited usefulness during fellowship due to concerns about lack of validity evidence, relevance, and how milestones are assessed and reported (Table).

**CONCLUSIONS:**

Most pediatric subspecialty programs do not use residency milestones to tailor education for their first-year fellows and most think they have limited usefulness. While more FPDs felt that residency milestones might be useful during recruitment, there was not universal agreement. Further studies to improve validity of residency milestones may make them more useful to fellowship programs.

## **A Systematic Review of the Use of Google Glass in Graduate Medical Education**

Carrera JF, Wang CC, Clark W, Southerland AM. J Grad Med Educ. 2019 Dec;11(6):637-648. doi: 10.4300/JGME-D-19-00148.1.

### **BACKGROUND:**

Graduate medical education (GME) has emphasized the assessment of trainee competencies and milestones; however, sufficient in-person assessment is often constrained. Using mobile hands-free devices, such as Google Glass (GG) for telemedicine, allows for remote supervision, education, and assessment of residents.

### **OBJECTIVE:**

We reviewed available literature on the use of GG in GME in the clinical learning environment, its use for resident supervision and education, and its clinical utility and technical limitations.

### **METHODS:**

We conducted a systematic review in accordance with 2009 PRISMA guidelines. Applicable studies were identified through a review of PubMed, MEDLINE, and Web of Science databases for articles published from January 2013 to August 2018. Two reviewers independently screened titles, abstracts, and full-text articles that reported using GG in GME and assessed the quality of the studies. A systematic review of these studies appraised the literature for descriptions of its utility in GME.

### **RESULTS:**

Following our search and review process, 37 studies were included. The majority evaluated GG in surgical specialties (n = 23) for the purpose of surgical/procedural skills training or supervision. GG was predominantly used for video teleconferencing, and photo and video capture. Highlighted positive aspects of GG use included point-of-view broadcasting and capacity for 2-way communication. Most studies cited drawbacks that included suboptimal battery life and HIPAA concerns.

### **CONCLUSIONS:**

GG shows some promise as a device capable of enhancing GME. Studies evaluating GG in GME are limited by small sample sizes and few quantitative data. Overall experience with use of GG in GME is generally positive.

**Could Blockchain Technology Empower Patients, Improve Education, and Boost Research in Radiology Departments?  
An Open Question for Future Applications**

Verde F, Stanzione A, Romeo V, Cuocolo R, Maurea S, Brunetti A. J Digit Imaging. 2019 Dec;32(6):1112-1115. doi: 10.1007/s10278-019-00246-8.

**ABSTRACT:**

Blockchain can be considered as a digital database of cryptographically validated transactions stored as blocks of data. Copies of the database are distributed on a peer-to-peer network adhering to a consensus protocol for authentication of new blocks into the chain. While confined to financial applications in the past, this technology is quickly becoming a hot topic in healthcare and scientific research. Potential applications in radiology range from upgraded monitoring of training milestones achievement for residents to improved control of clinical imaging data and easier creation of secure shared databases.

**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.

**Palliative Care and Communication Training in Neurosurgery Residency: Results of a Trainee Survey**

Miranda SP, Schaefer KG, Vates GE, Gormley WB, Buss MK. J Surg Educ. 2019 Nov - Dec;76(6):1691-1702. doi: 10.1016/j.jsurg.2019.06.010. Epub 2019 Jun 22.

**OBJECTIVE:**

Neurosurgeons care for critically ill patients near the end of life, yet little is known about how well their training prepares them for this role. We surveyed a random sample of neurosurgery residents to describe the quantity and quality of teaching activities related to serious illness communication and palliative care, and resident attitudes and perceived preparedness to care for seriously ill patients.

**METHODS:**

A previously validated survey instrument was adapted to reflect required communication and palliative care competencies in the 2015 the Accreditation Council for Graduate Medical Education (ACGME) Milestones for Neurological Surgery. The survey was reviewed for content validity by independent faculty neurosurgeons, piloted with graduating neurosurgical residents, and distributed online in August 2016 to neurosurgery residents in the United States using the American Association of Neurological Surgeons (AANS)/Congress of Neurological Surgeons (CNS) Joint Section on Neurotrauma and Critical Care email listserv. Multiple choice and Likert scale responses were analyzed using descriptive statistics.

**RESULTS:**

Sixty-two responses were recorded between August 2016 and October 2016. Most respondents reported no explicit teaching on: explaining risks and benefits of intubation and ventilation (69%), formulating prognoses in neurocritical care (60%), or leading family meetings (69%). Compared to performing craniotomies, respondents had less frequent practice leading discussions about withdrawing life-sustaining treatment (61% vs. 90%,  $p < 0.01$ , "weekly or more frequently"), and were less often observed (18% vs. 87%,  $p < 0.01$ ) and given feedback on their performance (11% vs. 58%,  $p < 0.01$ ). Nearly all respondents (95%) felt "prepared to discuss withdrawing life-sustaining treatments," however half (48%) reported they "would benefit from more communication training during residency." Most (87%) reported moral distress, agreeing that they "participated in operations and worried whether surgery aligned with patient goals."

**CONCLUSIONS:**

Residents in our sample reported limited formal training, and relatively less observation and feedback, on required ACGME competencies in palliative care and communication. Most reported preparedness in this domain, but many were receptive to more training. Better quality and more consistent palliative care education in neurosurgery residency could improve competency and help ensure that neurosurgical care aligns with patient goals.

## **Urology Milestones 2.0: The Future Looks Bright**

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

### **ABSTRACT:**

One of the major functions of the Accreditation Council for Graduate Medical Education (ACGME) is to accredit all approved residency programs. This accreditation system is based on both common and program-specific requirements that form the foundation of all ACGME-accredited training programs.

Embedded within the program requirements are the essential elements of the Competencies and Milestones. In this review article, we hope to provide the reader with an overview of the current Milestones and a preview of what lies ahead.

### **RECENT FINDINGS:**

Milestones for resident education were implemented approximately 7 years ago. The milestones were intended to create a logical trajectory of professional growth which could be measured and tracked for each sub-specialty. However, substantial variability in both content and developmental progression was seen in many specialties. The ACGME has been actively reviewing the Milestones to insure that there exists harmony across all specialties. Much has been learned about the milestones since their implementation. As educators, we need to provide a robust and reproducible system for all to use. The future of resident education, Milestones 2.0, will provide the necessary groundwork for a more user friendly system that will allow adequate evaluation of our trainees.

## **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/academic 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.

**Design and Implementation of Competency Based Postgraduate Medical Education in Otorhinolaryngology: The Pilot Experience in India.**

Karthikeyan P, Pulimoottil DT. Indian J Otolaryngol Head Neck Surg. 2019 Oct;71(Suppl 1):671-678. doi: 10.1007/s12070-018-1474-5. Epub 2018 Aug 23.

**ABSTRACT:**

The worldwide call for a shift towards competency based postgraduate medical education has until recently gone largely unheeded in India, despite the Medical Council of India enshrining the principle in its regulations for postgraduate institutions. This paper details the first concrete attempt at establishing a CBME curriculum in Otorhinolaryngology in India. The design and implementation of the CBME curriculum was carried out in four phases, in a time-bound manner over a period of 6 months. Phase I consisted of an extensive literature review and a clarification of the major objectives of the program. Phase II involved the listing out of 20-30 entrustable professional activities (EPAs) for each specialty and the 13 core EPAs common to all incoming residents and the subsequent mapping of these EPAs to their respective domains of competence and year-wise levels of competence. This was followed by the development of milestones for each EPA and appropriate clinical vignettes. Phase III focused on development of 360° assessment strategies, including the in-house development of an e- portfolio. Phase IV was dedicated to the implementation of the CBME curriculum, and involved various sensitization and orientation programs for faculty and the new residents. This exercise in designing and implementing a CBME program showed the important role that intra-departmental and inter- institutional cross-communication and exchange of ideas vies-a-vie workshops and personal communication play in bridging the lapses in knowledge in this emerging area, reaching consensus to achieve project goals and for finding relevant solutions to common problems. Medical education in India presents its own peculiar set of logistical and cultural challenges. Keeping in line with the recommendations of the Medical Council of India regarding Postgraduate Medical Education, it is essential that medical colleges in India not fall behind the international paradigm shift towards CBME.

**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 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.

**Discharge Summary Training Curriculum: A Novel Approach to Training Medical Students How to Write Effective Discharge Summaries**

Ming D, Zietlow K, Song Y, Lee HJ, Clay A. Clin Teach. 2019 Oct;16(5):507-512. doi: 10.1111/tct.12960. Epub 2018 Oct 30.

**BACKGROUND:**

Resident physicians at teaching hospitals write many discharge summaries (DCSs), but receive little formal training or feedback. Poor DCS quality poses a potential patient safety risk.

**METHODS:**

We developed a curriculum to train fourth-year medical students (MS4s) how to write DCSs and integrated this curriculum into a transition-to-residency course. An inpatient attending physician (IPA) and non-inpatient physician (coach) used structured tools to assess for the presence of key elements within the DCS, evaluate the overall quality of the DCS, and judge the student's progression towards entrustable professional activities and transitional year milestones. We identified overall areas of weakness and correlated scores between IPAs and coaches.

Improvements in student knowledge and DCS writing confidence were determined using pre- and post-curriculum surveys.

**RESULTS:**

Of 102 eligible students, 78 completed the assignment, 61 wrote a new DCS and 17 reviewed previously written DCSs. Patient condition at discharge was missing in more than 20.0% of DCSs. Coaches were less likely than IPAs to assess students as entrustable (58.3% versus 95.8%;  $p = 0.0027$ ). IPAs assigned higher overall quality ratings than coaches (8.0 versus 6.0 out of 10.0,  $p < 0.0001$ ). Post-intervention, 82.2% of students reported they learned how to write high-quality DCSs and 93.3% of students reported they would change the way they write DCSs.

**CONCLUSIONS:**

Graduating medical students have limited skill and comfort in writing DCSs. Structured training on how to write DCSs before postgraduate residency training is a key step towards ultimately improving transitions of care. Training should teach learners to write high-quality DCSs that serve the needs of both inpatient and outpatient providers. Resident physicians at teaching hospitals are expected to independently author [discharge summaries] DCSs, yet few receive formal training.



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

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

### **BACKGROUND:**

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

### **OBJECTIVE:**

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

### **METHODS:**

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

### **RESULTS:**

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

### **CONCLUSIONS:**

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

**Milestones on the Plastic Surgery In-Service Training Examination**

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

**BACKGROUND:**

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

**METHODS:**

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

**RESULTS:**

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

**CONCLUSIONS:**

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

## **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 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.

**Rising to the Challenge: Residency Programs' Experience With Implementing Milestones- Based Assessment**

Dzara K, Huth K, Kesselheim JC, Schumacher DJ. J Grad Med Educ. 2019 Aug;11(4):439-446. doi: 10.4300/JGME-D-18-00717.1.

**BACKGROUND:**

Changes to assessment efforts following the shift to milestones-based assessment in the ACGME Next Accreditation System have not been fully characterized.

**OBJECTIVE:**

This study describes themes in initial milestones-based assessment practices with the goal of informing continued implementation and optimization of milestones-based assessment.

**METHODS:**

Semistructured interviews were conducted with 15 residency program leaders in 6 specialties at 8 academic medical centers between August and December 2016. We explored what was retained, what was added, and what was changed from pre-milestones assessment efforts. We also examined the perceived impact of the shift to milestones-based assessment on the programs. Thematic analysis began after the first 5 interviews and ended once thematic sufficiency was reached. Two additional authors reviewed the codes, offered critical input, and informed the formation and naming of the final themes.

**RESULTS:**

Three themes were identified: (1) program leaders faced challenges to effective implementation; (2) program leaders focused on adaptability and making milestones work in what felt like a less than ideal situation for them; and (3) despite challenges, program leaders see value and utility in their efforts to move to milestones-based assessment. We describe a number of strategies that worked for programs during the transition, with perceived benefits acknowledged.

**CONCLUSIONS:**

While adaptation to milestones has occurred and benefits are noted, negative impacts and challenges (eg, perceived lack of implementation guidance and faculty development resources) persist. There are important lessons learned (eg, utilizing implementation experiences formatively to improve curricula and assessment) in the transition to milestones-based assessment.

## **Annotated Bibliography for Supervising Psychiatry Residents in Psychodynamic Psychotherapy**

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

### **OBJECTIVE:**

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

### **METHODS:**

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

### **RESULTS:**

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

### **CONCLUSIONS:**

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

**Effects of a Primary Palliative Care Educational System for Teaching Learners at Different Levels of Training**

El-Sourady M, Chen H, Martin SF, Ritchie J Ellis K, Richeson A Moore D, Karlekar M, Misra S. *Am J Hosp Palliat Care*. 2019 Aug;36(8):675-681. doi: 10.1177/1049909119834854. Epub 2019 Mar 7.

**ABSTRACT**

Interest and appreciation for palliative care (PC) has resulted in increased demand for both PC services and education. The PC rotation has been shown to improve PC knowledge in medical students (MS) and internal medicine (IM) residents, and PC specialists stand poised to direct the primary PC education of learners at different levels of training. To concurrently teach learners of different levels of training on a busy PC service, we created an educational system that emphasizes management of learner schedules, organization of teaching activities, faculty development to improve teaching skills, and learner self-evaluation. Both MS and IM residents showed an improvement in self-assessed competence as well as increased comfort level with seriously ill patients after PC rotation.

Careful adjustment of learner schedules has accommodated an increasing number of learners, while maintaining a low learner to faculty ratio. The PC educators face an exciting and daunting challenge as the number of patients with PC needs and the number of learners requesting PC experience grow. We continue to improve milestone-based PC assessment tools, to invest in faculty development, and to explore innovative ways to support PC educators as they strive to provide consistent PC education that is both useful for learners and can be incorporated into busy PC clinical practice.

**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.

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

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

**BACKGROUND:**

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

**METHODS:**

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

**RESULTS:**

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

**CONCLUSIONS:**

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

### **Some Assembly Required: Tracing the Interpretative Work of Clinical Competency Committees**

Pack R, Lingard L, Watling CJ, Chahine S, Cristancho SM. Med Educ. 2019 Jul;53(7):723-734. doi: 10.1111/medu.13884. Epub 2019 Apr 30.

#### **OBJECTIVES:**

This qualitative study describes the social processes of evidence interpretation employed by Clinical Competency Committees (CCCs), explicating how they interpret, grapple with and weigh assessment data.

#### **METHODS:**

Over 8 months, two researchers observed 10 CCC meetings across four postgraduate programmes at a Canadian medical school, spanning over 25 hours and 100 individual decisions. After each CCC meeting, a semi-structured interview was conducted with one member. Following constructivist grounded theory methodology, data collection and inductive analysis were conducted iteratively.

#### **RESULTS:**

Members of the CCCs held an assumption that they would be presented with high-quality assessment data that would enable them to make systematic and transparent decisions. This assumption was frequently challenged by the discovery of what we have termed 'problematic evidence' (evidence that CCC members struggled to meaningfully interpret) within the catalogue of learner data. When CCCs were confronted with 'problematic evidence', they engaged in lengthy, effortful discussions aided by contextual data in order to make meaning of the evidence in question. This process of effortful discussion enabled CCCs to arrive at progression decisions that were informed by, rather than ignored, problematic evidence.

#### **CONCLUSIONS:**

Small groups involved in the review of trainee assessment data should be prepared to encounter evidence that is uncertain, absent, incomplete, or otherwise difficult to interpret, and should openly discuss strategies for addressing these challenges. The answer to the problem of effortful processes of data interpretation and problematic evidence is not as simple as generating more data with strong psychometric properties. Rather, it involves grappling with the discrepancies between our interpretive frameworks and the inescapably subjective nature of assessment data and judgement.

**Who Moved my Fellow: Changes to Accreditation Council for Graduate Medical Education Fellowships in Pediatric Surgery and What May Be Yet to Come**

Alaish SM, Garcia AV. *Curr Opin Pediatr*. 2019 Jun;31(3):409-413. doi: 10.1097/ MOP. 0000000000000762.

**PURPOSE OF REVIEW:**

Over the past 15 years, the Accreditation Council for Graduate Medical Education (ACGME) has significantly altered the regulatory framework governing fellowship training in pediatric surgery. The daily experiences of pediatric surgical trainees have been impacted by these changes, but training program directors and faculty have not developed a consistent approach to managing this shift. This review highlights the changes, which have occurred, analyzes the current state of fellowship training, and proposes potential strategies for management.

**RECENT FINDINGS:**

The implementation of work hour restrictions, increased supervision requirements, the milestone evaluation program and most recently, enforcement of required critical care experience, have caused significant changes in the curriculum. Pediatric surgical trainees record more total cases, and more minimally invasive surgical (MIS) cases, in particular, than ever before. A subset of this increase may result from trainees performing cases previously assigned to general surgery residents. Teaching cases performed by fellows have decreased. Although the relationship between these shifts in training experience and the didactic curriculum is not clear, we also note that the Pediatric Surgery Certifying Examination failure rate has increased, approaching 20% in recent years.

**SUMMARY:**

It is unclear whether the changes in Pediatric Surgery training programs have been effective, or (conversely) have led to unintended consequences. Paradigm shifts in our training model may be required to address the changes in surgical education and skill acquisition, so that well tolerated, competent and skillful pediatric surgeons continue to enter the workforce.

## **Feedback with Performance Metric Scorecards Improves Resident Satisfaction but Does Not Impact Clinical Performance**

Mamtani M, Shofer FS, Sackeim A, Conlon L, Scott K, Mills AM. *AEM Educ Train.* 2019 May 20;3(4):323-330. doi: 10.1002/aet2.10348. eCollection 2019 Oct.

### **OBJECTIVES:**

The Emergency Medicine Milestone Project, a framework for assessing competencies, has been used as a method of providing focused resident feedback. However, the emergency medicine milestones do not include specific objective data about resident clinical efficiency and productivity, and studies have shown that milestone-based feedback does not improve resident satisfaction with the feedback process. We examined whether providing performance metric reports to resident physicians improves their satisfaction with the feedback process and their clinical performance.

### **METHODS:**

We conducted a three-phase stepped-wedge randomized pilot study of emergency medicine residents at a single, urban academic site. In phase 1, all residents received traditional feedback; in phase 2, residents were randomized to receive traditional feedback (control group) or traditional feedback with performance metric reports (intervention group); and in phase 3, all residents received monthly performance metric reports and traditional feedback. To assess resident satisfaction with the feedback process, surveys using 6-point Likert scales were administered at each study phase and analyzed using two-sample t-tests. Analysis of variance in repeated measures was performed to compare impact of feedback on resident clinical performance, specifically patient treatment time (PTT) and patient visits per hour.

### **RESULTS:**

Forty-one residents participated in the trial of which 21 were randomized to the intervention group and 20 in the control group. Ninety percent of residents liked receiving the report and 74% believed that it better prepared them for expectations of becoming an attending physician. Additionally, residents randomized to the intervention group reported higher satisfaction ( $p = 0.01$ ) with the quality of the feedback compared to residents in the control group. However, receiving performance metric reports, regardless of study phase or postgraduate year status, did not affect clinical performance, specifically PTT (183 minutes vs. 177 minutes,  $p = 0.34$ ) or patients visits per hour (0.99 vs. 1.04,  $p = 0.46$ ).

### **CONCLUSIONS:**

While feedback with performance metric reports did not improve resident clinical performance, resident physicians were more satisfied with the feedback process, and a majority of residents expressed liking the reports and felt that it better prepared them to become attending physicians. Residency training programs could consider augmenting feedback with performance metric reports to aide in the transition from resident to attending physician.

**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.

**Factors that Contribute to Resident Teaching Effectiveness**

Rutz M, Turner J, Pettit K, Palmer MM, Perkins A, Cooper DD. *Cureus*. 2019 Mar 21;11(3):e4290. doi: 10.7759/cureus.4290.

**BACKGROUND**

One of the key components of residency training is to become an educator. Resident physicians teach students, advanced practice providers, nurses, and even faculty on a daily basis.

**OBJECTIVE**

The goal of this study was to identify the objective characteristics of residents, which correlate with perceived overall teaching effectiveness.

**METHODS**

We conducted a one-year, retrospective study to identify factors that were associated with higher resident teaching evaluations. Senior emergency medicine (EM) teaching residents are evaluated by medical students following clinical teaching shifts. Eighteen factors pertaining to resident teaching effectiveness were chosen. Two items from the medical students' evaluations were analyzed against each factor: teaching effectiveness was measured on a five-point Likert scale and an overall teaching score (1-75).

**RESULTS**

A total of 46 EM residents and 843 medical student evaluations were analyzed. The ACGME milestones for systems-based practice ( $p = 0.02$ ) and accountability ( $p = 0.05$ ) showed a statistically significant association with a rating of "five" on the Likert scale for teaching effectiveness. Three other ACGME milestones, systems-based practice ( $p = 0.01$ ), task switching ( $p = 0.04$ ), and team management ( $p = 0.03$ ) also showed a statically significant association of receiving a score of 70 or greater on the overall teaching score.

**CONCLUSION**

Residents with higher performance associated with system management and accountability were perceived as highly effective teachers. USMLE and in-service exams were not predictive of higher teaching evaluations. Our data also suggest that effective teachers are working in both academic and community settings, providing a potential resource to academic departments and institutions.

**Identification of Gender Differences in Ultrasound Milestone Assessments during Emergency Medicine Residency Training: A Pilot Study**

Acuña J, Situ-LaCasse EH, Patanwala AE, Stolz LA, Amini R, Friedman L, Adhikari S. *Adv Med Educ Pract.* 2019 Mar 27;10:141-145. doi: 10.2147/AMEP.S196140. eCollection 2019.

**OBJECTIVES:**

Prior literature suggests that incongruities between male and female resident's procedural competency may be explained by gender bias during the evaluation process. There are no known studies investigating gender differences in the assessment of ultrasound-based procedural skills among emergency medicine (EM) residents. The purpose of this study was to evaluate for gender differences in ultrasound milestone assessments among EM residents.

**METHODS:**

This is a retrospective study including EM residents. Milestone assessment data were collected from a total of 3 Accreditation Council for Graduate Medical Education (ACGME) EM residency programs representing a 3-year period. The outcome measures included mean milestone levels, milestone levels at baseline and graduation and differences in milestone achievement between female and male EM residents. An unpaired Student's t-test was used to compare milestone scores between female and male residents.

**RESULTS:**

A total of 456 ultrasound milestone evaluations were collected from 91 EM residents (34 females[37%] and 57 males [63%]). No significant differences were noted in the overall mean milestone level between females ( $2.3 \pm 0.6$ ) and males ( $2.2 \pm 0.6$ ) ( $P=0.387$ ). There were no significant differences noted in the ultrasound milestone level between females ( $0.8 \pm 0.6$ ) and males ( $0.7 \pm 0.7$ ) at baseline ( $P=0.754$ ). Although it did not reach statistical significance ( $P=0.197$ ), the increase in the mean ultrasound milestone level from baseline to graduation was greater in males ( $3.4 \pm 0.7$ ) compared to females ( $3.1 \pm 0.7$ ).

**CONCLUSION:**

Overall, there were no statistically significant differences in the mean ultrasound milestone levels between females and males. The rate of ultrasound milestone level achievement during EM residency training at our institution had a slight tendency to be higher for males than females in the observed residency programs; however, this also did not reach statistical significance. Possible gender bias while evaluating ultrasound milestone levels needs to be further studied on a larger scale.



**Surgical Simulation: Markers of Proficiency**

Binkley J, Bukoski AD, Doty J, Crane M, Barnes SL, Quick JA. J Surg Educ. 2019 Jan - Feb;76 (1): 234-241. doi: 10.1016/j.jsurg.2018.05.018. Epub 2018 Jul 6.

**OBJECTIVE:**

Surgical simulation has become an integral component of surgical training. Simulation proficiency determination has been traditionally based upon time to completion of various simulated tasks. We aimed to determine objective markers of proficiency in surgical simulation by comparing novel assessments with conventional evaluations of technical skill.

**DESIGN:**

Categorical general surgery residents completed 10 laparoscopic cholecystectomy modules using a high-fidelity simulator. We recorded and analyzed simulation task times, as well as number of hand movements, instrument path length, instrument acceleration, and participant affective engagement during each simulation. Comparisons were made to Objective Structured Assessment of Technical Skill (OSATS) and Accreditation Council for Graduate Medical Education Milestones, as well as previous laparoscopic experience, duration of laparoscopic cholecystectomies performed by participants, and postgraduate year. Comparisons were also made to Fundamentals of Laparoscopic Surgery task times. Spearman's rho was utilized for comparisons, significance set at  $>0.50$ .

**SETTING:**

University of Missouri, Columbia, Missouri, an academic tertiary care facility.

**PARTICIPANTS:**

Fourteen categorical general surgery residents (postgraduate year 1-5) were prospectively enrolled.

**RESULTS:**

One hundred forty simulations were included. The number of hand movements and instrument path lengths strongly correlated with simulation task times ( $\rho$  0.62-0.87,  $p < 0.0001$ ), FLS task completion times ( $\rho$  0.50-0.53,  $p < 0.0001$ ), and prior real-world laparoscopic cholecystectomy experience ( $\rho$  -0.51 to -0.53,  $p < 0.0001$ ). No significant correlations were identified between any of the studied markers with Accreditation Council for Graduate Medical Education Milestones, Objective Structured Assessment of Technical Skill evaluations, total previous laparoscopic experience, or postgraduate year level. Neither instrument acceleration nor participant engagement showed significant correlation with any of the conventional markers of real-world or simulation skill proficiency.

**CONCLUSIONS:**

Simulation proficiency, measured by instrument and hand motion, is more representative of simulation skill than simulation task time, instrument acceleration, or participant engagement.

**Evaluation of a Modified Objective Structured Assessment of Technical Skills Tool for the Assessment of Pediatric Laceration Repair Performance**

Uspal NG, Thomas AA, Burns R, Jones M, Gross IT, Kearney RD, Whitney RE, Uspal JE, Gove N, Reid J· Cureus. 2019 Feb 12;11(2):e4056. doi: 10.7759/cureus.4056.

**INTRODUCTION:**

The Accreditation Council for Graduate Medical Education (ACGME) has developed milestones including procedural skills under the core competency of patient care. Progress in training is expected to be monitored by residency programs. To our knowledge, there exists no tool to evaluate pediatric resident laceration repair performance.

**METHODS:**

The Objective Structured Assessment of Technical Skills was adapted to evaluate resident laceration repair performance using two components: a global rating scale (GRS) and a checklist. Pediatric and family medicine residents at a tertiary care children's hospital were filmed performing a simulated laceration repair. Videos were evaluated by at least five physicians trained in laceration repair. Concordance correlation coefficients (CCC) were calculated for the GRS and checklist scores. Scores for each resident were compared across levels of training and procedural experience. Spearman's rank order correlations were calculated to compare the checklist and GRS. Results Thirty residents were filmed performing laceration repair procedures. The CCC showed fair concordance across reviewers for the checklist (0.55, 95% CI: 0.38-0.69) and the GRS (0.53, 95% CI: 0.36-0.67). There was no significant difference in scores by self-reported experience or training level. There was correlation between the median GRS and checklist scores (Spearman  $\rho = 0.730$ ,  $p < .001$ ).

**CONCLUSIONS:**

A novel tool to evaluate resident laceration repair performance in a pediatric emergency department showed fair agreement across reviewers. The study tool is not precise enough for summative evaluation; however, it can be used to distinguish between trainees who have and have not attained competence in laceration repair for formative feedback.

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

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

**ABSTRACT:**

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

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

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

**BACKGROUND:**

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

**METHODS:**

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

**RESULTS:**

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

**CONCLUSIONS:**

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

**Choosing Our Own Pathway to Competency-Based Undergraduate Medical Education.**

Veale P, Busche K, Touchie C, Coderre S, McLaughlin K. Acad Med. 2019 Jan;94(1):25-30. doi: 10.1097/ACM.0000000000002410.

**ABSTRACT:**

After many years in the making, an increasing number of postgraduate medical education (PGME) training programs in North America are now adopting a competency-based medical education (CBME) framework based on entrustable professional activities (EPAs) that, in turn, encompass a larger number of competencies and training milestones. Following the lead of PGME, CBME is now being incorporated into undergraduate medical education (UME) in an attempt to improve integration across the medical education continuum and to facilitate a smooth transition from clerkship to residency by ensuring that all graduates are ready for indirect supervision of required EPAs on day one of residency training. The Association of Faculties of Medicine of Canada recently finalized its list of 12 EPAs, which closely parallels the list of 13 EPAs published earlier by the Association of American Medical Colleges, and defines the "core" EPAs that are an expectation of all medical school graduates. In this article, the authors focus on important, practical considerations for the transition to CBME that they feel have not been adequately addressed in the existing literature. They suggest that the transition to CBME should not threaten diversity in UME or require a major curricular upheaval. However, each UME program must make important decisions that will define its version of CBME, including which terminology to use when describing the construct being evaluated, which rating tools and raters to include in the assessment program, and how to make promotion decisions based on all of the available data on EPAs.

**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.

**Training, Education for Robotic Performance with Simulation (Terps): A Valuable Tool For Gynecologic Surgeons In Training**

Helou C, Seal P, Sanses T, Morozov V, Roque D. *Journal of Minimally Invasive Gynecology*. 2019;26:S159.

To evaluate the role of robotic simulation in training OBGYN residents by determining an optimal number of exercise repetitions prior to clinical debut; To assess whether clinical exposure accelerates proficiency by correlating laparoscopic/robotic experience with simulator skills acquisition Prospective cohort study Urban academic center with active COEMIG designation 2017-2018 Gynecology residents(PGY1-4) Voluntary participants were instructed to complete 10 repetitions of 5 exercises (pegboard-1, energy dissection-1, energy switching-1, ring&rail-2, tubes) on the dV-Trainer® robotic simulator. After a 4-month hiatus, residents were asked to repeat the protocol. Residents were surveyed regarding prior surgical experience and perceptions regarding simulation utility. 25 of 28(89%) residents participated. Performance was captured using M-scores® (aggregate quality, efficiency, risk, and safety measure). With all exercises, M-scores® increased with repetitions among all levels (mean±SD 58.9±19.1 repetition 1 versus 82.0±13.6 repetition 10,  $p<0.001$ ); however, after one round, many trainees failed to attain the pre-determined passing score of 80%. Across all participants, mean scores by exercise were 82.5±15.6, 78.0±15.8, 72.6±17.9, 62.7±19.4, 60.1±22.1 ( $p<0.001$ ). Neither PGY level nor prior surgical experience correlated with higher scores: repetition-1 scores were 61±12.8, 54.0±11.2, 59.4 ±19.7, and 59.8±10.6 for PGY-1 through -4 participants,  $p=0.51$ ; repetition-10 scores were 80±3.9, 82±9.3, 86.5±9.3, and 84.9±9.0,  $p=0.79$ , respectively. Self-reported prior surgical experience reflected graduated responsibility: only PGY-4 participants reported console exposure, with most describing 1-5 cases performed. Retention of skills at 4 months negatively correlated with difficulty, suggesting challenging skills require more repetitions to master. Poor compliance hindered data interpretation. The majority of trainees believed simulation is valuable. Robotic simulation may be useful for development/maintenance of robotic skills in Gynecology trainees. M-score® may be insufficiently sensitive; additional metrics should be explored. Robotic simulation is valued by trainees, however, not a milestone established by the ACGME. Protected time with incorporation into curricula would be needed to maximize utility.

**Information within Residency Monthly Evaluation Forms at Two Institutions**

Cooper CJ, Wehner P, Dailey C, O'Connor N, Kleshinski J, Shapiro JI. *Medical Education Online*. 2019;24(1):1635844. doi:10.1080/10872981.2019.1635844.

**ABSTRACT:**

Periodic review of resident performance is an important aspect of residency training. Amongst allopathic residency programs, it is expected that the performance of resident physicians which can be grouped based on the ACGME core competencies, be assessed so as to allow for effective feedback and continuous improvement. Review of monthly evaluation forms for residents in the core ACGME programs at Marshall University and the University of Toledo demonstrated a wide spread in the number of Likert questions that faculty were asked to complete. This number ranged from a low of 7 in Surgery to a high of 65 in Psychiatry (both Marshall Programs). Correlation and network analysis were performed on these data. High degrees of correlations were noted between answers to questions (controlled for each resident) on these forms at both institutions. In other words, although evaluation scores varied tremendously amongst the different residents in all the programs studied, scores addressing different competencies tended to be very similar for the same resident, especially in some of the programs which were studied. Network analysis suggested that there were clusters of questions that produced essentially the same answer for a given resident, and these clusters were bigger in some of the different residency program assessment forms. This seemed to be more the rule in the residency programs with large numbers of Likert questions. The authors suggest that reducing the number of monthly questions used to address the core competencies in some programs may be possible without substantial loss of information.



**Intern Self-Reported Preparedness for Residency: An ACGME Milestone-Based Study**

McLean ME, Huls TA, Park JC, Anana MC, Chen AS, Chien GK, Cygan L, Gupta SJ, Husain A, Mishra DN, Ng KM, Russell JT, Surlles RT, Kulkami ML. *Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health*. 2019;20:S10.

**OBJECTIVE**

Transitioning from medical school to internship is challenging. While several curricula for medical students and interns have been proposed during this transition period, there has not been a large-scale self-assessment of incoming emergency medicine (EM) interns' preparedness for EM milestones. While many medical schools and EM residencies host "boot camps" or other intensive orientation programs for EM-bound students, having knowledge of incoming EM residents' self-perceived strengths and weaknesses will help clerkship directors and EM residency leadership better serve this group of learners. Milestones in EM are used in the United States to measure residents' progress and determine competence at residency completion.<sup>4</sup> Incoming interns are expected to have achieved level 1 milestones by the time they enter residency, to have achieved level 2 milestones between the first and second year, and to have achieved level 4 milestones before completion of residency. We reached out to 151 newly-matched interns at 11 different sites to ask about their self-perceived "preparedness" for levels 1, 2, and 3 of our eight selected EM milestones (numbers 1, 3, 4, 5, 7, 9, 10, and 12).

**DESIGN AND METHOD:**

This was a prospective, cross-sectional study of 151 newly-matched pre-interns at 11 EM residency programs. We included all newly-matched interns at each program. Interns were invited via email from their programs to complete a voluntary, anonymous survey prior to the start of residency. The survey used a Likert scale (1 = very unprepared to 5 = extremely prepared) to assess self-reported preparedness to perform levels 1 and 2 of milestones 1, 3, 4, 5, 7, 9, 10, and 12. Milestones were chosen based on ease of teaching in an EM case curriculum that was later implemented.

**RESULTS:**

A total of 126 pre-interns completed the survey (response rate 83.4%).

**CONCLUSION:**

Subjects reported highest level of preparedness for emergency stabilization (PC1), and lowest levels of preparedness for airway management (PC10) and pharmacological management (PC5). The data suggest that teachers of fourth-year medical students and new EM interns may want to emphasize milestones 5 and 10 early in internship or late in medical school.

**Effectiveness of the Adolescent Medicine Rotation in Improving Pediatric Residents Self- Assessed Skill and Confidence Caring for Youth**

Ruedinger E, Carlin K, Inwards-Breland D, McCarty CA. J Adolesc Health. 2018 Dec 6. pii: S1054-139X(18)30468-3. doi: 10.1016/j.jadohealth.2018.10.007.

**PURPOSE:**

Practicing and resident pediatricians report inadequate skill in caring for adolescents, despite adolescents comprising roughly one-quarter of most general and subspecialty practices. This study examined the effectiveness of participation in an adolescent medicine rotation at improving pediatric residents' self-perceived skills and confidence across nine key adolescent health domains. We also evaluated the impact of didactic instruction during the rotation.

**METHODS:**

Resident and recent-graduate participants (n = 34) completed milestone-based self-assessment of their skill and confidence caring for adolescent patients in nine key adolescent health-related domains. This study employed a post-test then retrospective pretest, an educational study design used to minimize response-shift bias whereby participants rate their skill and confidence at the end of the intervention (post-test), and then reflect back to retrospectively rate their preintervention skill (retrospective pretest). Additionally, differences in gains between those who did and did not participate in didactic instruction were evaluated. Didactic instruction was delivered during the adolescent medicine rotation utilizing a flipped-classroom model; participants received standardized preparatory materials and participated in active-learning workshops.

**RESULTS:**

Participants demonstrated a significant ( $p \leq .0001$ ) increase in self-perceived skill levels for all assessed domains after the rotation as compared to before the rotation, whether or not they received didactic instruction. Participation in didactic instruction did not yield significant ( $p \leq .05$ ) additional benefit for any of the assessed domains.

**CONCLUSIONS:**

Participation in an adolescent medicine rotation is of value to pediatric resident trainees and leads to increased self-assessed skill and confidence in caring for youth.

## **Program Director Perceptions of Usefulness of the Accreditation Council for Graduate Medical Education Milestones System for Urology Resident Evaluation**

Sebesta EM, Cooper KL, Badalato GM. Urology. 2018 Nov 8. pii: S0090-4295(18)31132-4. doi: 10.1016/j.urology.2018.10.042.

### **OBJECTIVES:**

To assess the application and perceived usefulness of the Accreditation Council for Graduation Medical Education (ACGME) Milestones system for resident evaluation among urology program directors (PDs).

### **METHOD:**

We conducted an online survey of 133 urology PDs. The survey addressed several domains: (1) demographic information, (2) logistics and implementation of the faculty Clinical Competency Committee (CCC) meetings, and (3) perceived overall effectiveness and usefulness of the Milestones assessments.

### **RESULTS:**

Eighty-eight responses were obtained (66% response rate). A total of 42/88 programs (48%) described the Milestones as very or somewhat unhelpful in resident evaluation, with a comparable proportion (44%) responding Milestones assessments never or almost never accurately distinguished between residents. Respondents felt higher scores on all domains of the Milestones were completely or somewhat uncorrelated to higher inservice exam scores (58%), with a smaller fraction (49%) deeming they were not predictive of board passage rates. Overall, 30% of respondents answered neutrally as to whether they felt the Milestones format has led to better resident formative feedback, and 35% were neutral as to the implications of this system toward promoting professional development.

### **CONCLUSIONS:**

The ACGME Milestones system for resident evaluation was initiated to create a uniform competency- based assessment system; however, a sizable proportion of urology PDs in our cohort did not find the Milestones system helpful or accurate in assessing residents or predicting future successes. Given the Milestones system is still in its infancy, the utility of this system within urology has yet to be fully assessed.

**Standardized Patients to Assess Resident Interpersonal Communication Skills and Professional Values Milestones**

Vora S, Lineberry M, Dobiesz VA. West J Emerg Med. 2018 Nov;19(6):1019-1023. doi: 10.5811/ westjem.2018.8.37204. Epub 2018 Oct 18.

**ABSTRACT:**

It has been a challenge to assess communication and professional values Milestones in emergency medicine (EM) residents using standardized methods, as mandated by the Accreditation Council for Graduate Medical Education (ACGME). This paper outlines an innovative method of assessing these Milestones using an established instructional method. EM faculty mapped the communication and professional values Milestones to an existing communication and interpersonal skills scale. We identified six communication-focused scenarios: death notification; informed consent; medical non-compliance; medical error; treatment refusal; and advanced directives. In a pilot, 18 EM residents completed these six standardized patient (SP) encounters. Our experience suggests SP encounters can support standardized direct observation of residents' achievement of ACGME Milestones. Further effort can be made to create a tailored, behaviorally-anchored tool that uses the Milestones as the conceptual framework.

**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. 2018 Nov 21. pii: S1931- 7204(18) 30440-9. doi: 10.1016/j.jsurg.2018.10.006.

**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.

**Electronic Health Records as an Educational Tool: Viewpoint**

Habboush Y, Hoyt R, Beidas S. JMIR Med Educ. 2018 Nov 12;4(2):e10306. doi: 10.2196/10306.

**BACKGROUND:**

Electronic health records (EHRs) have been adopted by most hospitals and medical offices in the United States. Because of the rapidity of implementation, health care providers have not been able to leverage the full potential of the EHR for enhancing clinical care, learning, and teaching. Physicians are spending an average of 49% of their working hours on EHR documentation, chart review, and other indirect tasks related to patient care, which translates into less face time with patients.

**OBJECTIVE:**

The purpose of this article is to provide a preliminary framework to guide the use of EHRs in teaching and evaluation of residents.

**METHODS:**

First we discuss EHR educational capabilities that have not been reviewed in sufficient detail in the literature and expand our discussion for each educational activity with examples. We emphasize quality improvement of clinical notes as a basic foundational skill using a spreadsheet-based application as an assessment tool. Next, we integrate the six Accreditation Council for Graduate Medical Education (ACGME) Core Competencies and Milestones (CCMs) framework with the Reporter-Interpreter-Manager-Educator (RIME) model to expand our assessments of other areas of resident performance related to EHR use. Finally, we discuss how clinical utility, clinical outcome, and clinical reasoning skills can be assessed in the EHR.

**RESULTS:**

We describe a pilot conceptual framework-CCM framework-to guide and demonstrate the use of the EHR for education in a clinical setting.

**CONCLUSIONS:**

As EHRs and other supporting technologies evolve, medical educators should continue to look for new opportunities within the EHR for education. Our framework is flexible to allow adaptation and use in most training programs. Future research should assess the validity of such methods on trainees' education.

**Does Incorporating a Measure of Clinical Workload Improve Workplace-Based Assessment Scores? Insights for Measurement Precision and Longitudinal Score Growth from Ten Pediatrics Residency Programs**

Park YS, Hicks PJ, Carraccio C, Margolis M, Schwartz A; PMAC Module 2 Study Group. Acad Med. 2018 Nov;93(11S Association of American Medical Colleges Learn Serve Lead: Proceedings of the 57th Annual Research in Medical Education Sessions):S21-S29. doi: 10.1097/ACM.0000000000002381.

**PURPOSE:**

This study investigates the impact of incorporating observer-reported workload into workplace-based assessment (WBA) scores on (1) psychometric characteristics of WBA scores and (2) measuring changes in performance over time using workload-unadjusted versus workload-adjusted scores.

**METHOD:**

Structured clinical observations and multisource feedback instruments were used to collect WBA data from first-year pediatrics residents at 10 residency programs between July 2016 and June 2017.

Observers completed items in 8 subcompetencies associated with Pediatrics Milestones. Faculty and resident observers assessed workload using a sliding scale ranging from low to high; all item scores were rescaled to a 1-5 scale to facilitate analysis and interpretation. Workload-adjusted WBA scores were calculated at the item level using three different approaches, and aggregated for analysis at the competency level. Mixed-effects regression models were used to estimate variance components.

Longitudinal growth curve analyses examined patterns of developmental score change over time.

**RESULTS:**

On average, participating residents ( $n = 252$ ) were assessed 5.32 times (standard deviation = 3.79) by different raters during the data collection period. Adjusting for workload yielded better discrimination of learner performance, and higher reliability, reducing measurement error by 28%. Projections in reliability indicated needing up to twice the number of raters when workload-unadjusted scores were used. Longitudinal analysis showed an increase in scores over time, with significant interaction between workload and time; workload also increased significantly over time.

**CONCLUSIONS:**

Incorporating a measure of observer-reported workload could improve the measurement properties and the ability to interpret WBA scores.

**2017 Program Director Survey: Feedback from your Adult Neurology Residency Leadership**

London ZN, Khan J, Cahill C, Schuyler E, Wold J, Southerland AM. *Neurology*. 2018 Oct 9;91 (15): e1448-e1454. doi: 10.1212/WNL.0000000000006315. Epub 2018 Sep 7.

**OBJECTIVE:**

To survey adult neurology program directors (PDs) and inform the future development of neurology training programs.

**METHODS:**

All US adult neurology PDs were invited to complete the survey. The goals were to determine the demographic makeup of residency programs, characterize curricula, understand PD and program needs, and compare results to those of a similar survey in 2007.

**RESULTS:**

The response rate was 70.6%. PD demographics for age, faculty track status, and academic rank remain unchanged over the last decade. The proportion of female PDs and assistant PDs has increased significantly. The mean number of residents per training program has also increased significantly. Female PDs are more likely to have a junior academic rank than their male colleagues. Disparities remain between the PDs' time spent on teaching/program administration and salary support. Most PDs support moving fellowship applications later in the training cycle. The majority of PDs find the Clinical Competency Committee process useful in assessing resident competence. A minority of PDs feel that the Accreditation Council for Graduate Medical Education Milestones meet their intended purpose. Half of programs include a curriculum to supplement the clinical experience on child neurology rotations. A third of programs include a supplemental curriculum for psychiatry rotations. The majority of programs offer a general fund for residents to use to support their education.

**CONCLUSION:**

Deficiencies exist in compensation for PDs' teaching and administrative time and for academic promotion for female PDs. These results serve as a benchmark for comparison across programs and the basis to advocate for further improvements and support for neurology residency training.



**Predictability of Clinical Knowledge Through Mobile App-based Simulation for the Treatment of Pediatric Septic Arthritis: A Pilot Study**

Shore BJ, Miller PE, Noonan KJ, Bae DS. J Pediatr Orthop. 2018 Oct;38(9):e541-e545. doi: 10.1097/BPO.0000000000001228.

**BACKGROUND:**

Recently the American Board of Orthopaedic Surgery and the Accreditation Council of Graduate Medical Education have identified the treatment of septic arthritis of the hip in children as a milestone skill for all US orthopaedic residents. The purpose of this study was to test correlation between clinical knowledge and examination score on a mobile app-based training module for the treatment of pediatric septic hip arthritis.

**METHODS:**

A 4-part simulation model on surgical decision-making associated with the treatment of pediatric septic arthritis was developed through expert consensus. Orthopaedic trainees participating in the "Top Gun" program of the 2015 and 2016 International Pediatric Orthopaedic Symposia were recruited to participate in this pilot study. Trainees completed a presimulation quiz on their knowledge of diagnosis, arthrocentesis, and surgical irrigation and debridement on a pediatric patient presenting with septic arthritis of the hip. Trainees then completed the 4-part simulation on the mobile app. Pearson correlation analysis was used to assess the relationship between the quiz and the simulation.

**RESULTS:**

A total of 53 orthopaedic residents and fellows participated in the simulation. Median quiz score was 87 points [interquartile range (IQR), 81 to 94] before the intervention and 100 points (IQR, 94 to 100) postintervention. The median simulation test score was 89 (IQR, 81 to 92) which demonstrated a positive correlation with the postintervention quiz ( $r=0.44$ ,  $P<0.001$ ). The preintervention metrics demonstrated a positive correlation with postintervention metrics ( $r=0.53$ ,  $P<0.001$ ).

**CONCLUSIONS:**

This study revealed a statistically significant positive correlation between the mobile app simulation and the clinical knowledge of the participants, as well as the ability to improve knowledge about a procedure during the testing period. These findings support the ability for the mobile app to test clinical knowledge. In the current environment of decreased work hours and patient exposure for orthopaedic trainees, mobile app-based simulation has the potential to safely aid in assessment of orthopaedic residents and fellows.

### **Timing of Milestone Competency Acquisition in Neurology Residency: What by When?**

Jones LK Jr, Eggers SDZ, Capobianco DJ, Boes CJ. Neurology. 2018 Oct 16;91(16):748-754. doi: 10.1212/WNL.0000000000006361. Epub 2018 Sep 14.

#### **OBJECTIVE:**

To determine the stage of training at which neurology residents should achieve individual elements of the Accreditation Council for Graduate Medical Education neurology Milestones and to examine the relationship between perceived importance of Milestones and the stage by which they should be achieved.

#### **METHODS:**

A modified Delphi technique was used to establish consensus postgraduate year (PGY) expectations for neurology Milestone competencies across 3 geographically and administratively distinct Mayo Clinic neurology residency programs. Timing expectations were examined for relationships to perceived importance of the individual Milestones and effects of participant characteristics.

#### **RESULTS:**

PGY expectations for neurology Milestone elements ranged from PGY 1.3 to PGY 4.1. Extent of rater educational seniority had no effect on PGY competency expectations. There was a moderate inverse relationship between perceived importance of the Milestone element and the PGY by which it should be achieved ( $r_s = -0.74$ ,  $p < 0.0001$ ).

#### **CONCLUSIONS AND RELEVANCE:**

Expectations for neurology Milestone competency acquisition can be measured and may help inform individual program design, educational expectations, and future Milestone design.

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

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

**RATIONALE AND OBJECTIVES:**

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

**MATERIALS AND METHODS:**

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

**RESULTS:**

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

**DISCUSSION:**

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

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More specific needs assessments are warranted on a national level.

**Communication Skills Training for Surgical Residents: Learning to Relate to the Needs of Older Adults**

Roberts L, Cornell C, Bostrom M, Goldsmith S, Ologhobo T, Roberts T, Robbins L. *J Surg Educ.* 2018 Sep - Oct;75(5):1180-1187. doi: 10.1016/j.jsurg.2018.02.005. Epub 2018 Mar 31.

**BACKGROUND:**

It is vital for physicians and surgeons to communicate successfully with older adults, who will constitute one-fifth of the US population by 2030. Older adults often perceive themselves as stigmatized and powerless in healthcare settings. Effective communication leads to better patient compliance and satisfaction, which is now a component of Medicare hospital reimbursement and physician and surgeon compensation from hospitals and networks.

**OBJECTIVE:**

To increase orthopaedic surgery resident understanding of the unique needs of older adults in order to maintain effective and sensitive communication with this vulnerable population.

**DESIGN:**

A two-part training program (ongoing for 8 years) comprised of: 1) small-group interactive didactic sessions on aging issues; and 2) workshop demonstrations given by the residents to a group of older adults, followed by a Question & Answer session. Residents were assessed using a 22-item pre-post questionnaire covering medical knowledge of aging, attitudes toward older adults, and personal anxiety about aging. Older adult participants were surveyed for perceptions of residents' sensitivity toward them.

**SETTING:**

Hospital for Special Surgery in New York City, a specialized urban academic center, with a 5- year Orthopedic Surgery Residency program.

**PARTICIPANTS:**

70 PGY3 residents, for whom the program is a requirement, and 711 older adult participants recruited from a community convenience sample.

**RESULTS:**

Older adult participants: Of 711 participants, 672 (95%) responded; 96% strongly agreed/agreed that the residents had demonstrated sensitivity toward them. Residents: Of 70 residents, 35 (50%) were assessed. Mean knowledge scores increased significantly ( $p \leq 0.001$ ); five of nine attitude items ( $p \leq 0.05$ ) and one of four anxiety items improved significantly ( $p \leq 0.001$ ).

**CONCLUSIONS:**

Significant change was seen in residents' attitudes and anxiety levels toward older adults, attributes that are usually deep seated and hard to change. Residents moved along the Accreditation Council for Graduate Medical Education Milestones continuum for three core competencies.

## **Radiology Resident Assessment and Feedback Dashboard**

Durojaiye AB, Snyder E, Cohen M, Nagy P, Hong K, Johnson PT. Radiographics. 2018 Sep- Oct;38 (5): 1443-1453. doi: 10.1148/rg.2018170117. Epub 2018 Aug 10.

### **ABSTRACT:**

Assessment of residents is optimally performed through processes and platforms that provide daily feedback, which can be immediately acted on. Given the documentation required by the Accreditation Council for Graduate Medical Education (ACGME), effective data management, integration, and presentation are crucial to ease the burden of manual documentation and increase the timeliness of actionable information. To this end, the authors modeled the learning activities of residents using the Experience Application Programming Interface (xAPI) framework, which is a standard framework for the learning community. On the basis of the xAPI framework and using open-source software to extend their existing infrastructure, the authors developed a Web-based dashboard that provides residents with a more holistic view of their educational experience. The dashboard was designed around the ACGME radiology milestones and provides real-time feedback to residents using various assessment metrics derived from multiple data sources. The purpose of this article is to describe the dashboard's architecture and components, the design and technical considerations, and the lessons learned in implementing the dashboard.

**Pediatric Program Director Minimum Milestone Expectations before Allowing Supervision of Others and Unsupervised Practice**

Li ST, Tancredi DJ, Schwartz A, Guillot A, Burke AE, Trimm RF, Guralnick S, Mahan JD, Gifford K. Acad Pediatr. 2018 Sep - Oct;18(7):828-836. doi: 10.1016/j.acap.2018.04.010. Epub 2018 Apr 25.

**BACKGROUND:**

The Accreditation Council for Graduate Medical Education requires semiannual Milestone reporting on all residents. Milestone expectations of performance are unknown.

**OBJECTIVE:**

Determine pediatric program director (PD) minimum Milestone expectations for residents prior to being ready to supervise and prior to being ready to graduate.

**METHODS:**

Mixed methods survey of pediatric PDs on their programs' Milestone expectations before residents are ready to supervise and before they are ready to graduate, and in what ways PDs use Milestones to make supervision and graduation decisions. If programs had no established Milestone expectations, PDs indicated expectations they considered for use in their program. Mean minimum Milestone level expectations adjusted for program size, region, and clustering of Milestone expectations by program were calculated for prior to supervise and prior to graduate. Free-text questions were analyzed using thematic analysis.

**RESULTS:**

The response rate was 56.8% (113/199). Most programs had no required minimum Milestone level before residents are ready to supervise (80%; 76/95) or ready to graduate (84%; 80/95). For readiness to supervise, minimum Milestone expectations PDs considered establishing for their program were highest for humanism (2.46, 95% CI: 2.21-2.71) and professionalization (2.37, 2.15-2.60). Minimum Milestone expectations for graduates were highest for help-seeking (3.14, 2.83-3.46). Main themes included the use of Milestones in combination with other information to assess learner performance and Milestones are not equally weighted when making advancement decisions.

**CONCLUSIONS:**

Most PDs have not established program minimum Milestones, but would vary such expectations by competency.

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

Tekian A, Borhani M, Tilton S, Abasolo E, Park YS. Am J Surg. 2018 Sep 29. pii: S0002-9610(18)30530-0. doi: 10.1016/j.amjsurg.2018.09.031.

**BACKGROUND:**

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

**METHODS:**

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

**RESULTS:**

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

**CONCLUSIONS:**

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



**Challenges in Measuring ACGME Competencies: Considerations for Milestones**

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

**BACKGROUND:**

Measuring milestones, competencies, and sub-competencies as residents progress through a training program is an essential strategy in Accreditation Council for Graduate Medical Education (ACGME)'s attempts to ensure graduates meet expected professional standards.

Previous studies have found, however, that physicians make global ratings often by using a single criterion.

**METHODS:**

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

**RESULTS:**

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

**CONCLUSIONS:**

Evaluation forms measuring the six core ACGME competencies did not possess adequate validity. Severe multicollinearity exists for the six competencies in this study. ACGME is introducing milestones with 24 sub-competencies. Attempting to measure these as discrete elements, without recognizing the inherent weaknesses in the tools used will likely serve to exacerbate an already flawed strategy.

Physicians likely use their "gut feelings" to judge a resident's overall performance. A better process could be conceived in which this subjectivity is acknowledged, contributing to more meaningful evaluation and feedback.

**Meeting Milestones: Results of a Quality-Improvement Curriculum to Achieve Cost-Conscious Care**

Chang O, Jordan J, Shah N, Mendiola M, Merport Modest A, Golen T. J Eur CME. 2018 Sep 25;7(1):1517572. doi: 10.1080/21614083.2018.1517572. eCollection 2018.

**ABSTRACT:**

There is a lack of residency education in cost-conscious care. We implemented a costing and quality improvement (QI) curriculum to Obstetrics and Gynaecology trainees using "Time-Driven Activity- Based Costing (TDABC)," and assessed its educational impact. The curriculum included didactic and practical portions. Pre-and post-knowledge surveys were obtained from 24 residents on self-perceived knowledge of key QI principles. Self-perceived knowledge, before and after the curriculum, was scored on a Likert scale from 0 to 5 points (0 is the least knowledge and 5 is the most knowledge).

The mean scores reported an increase in knowledge of clinical guideline development (pre = 1.19 vs. post = 3.07,  $p = 0.0052$ ); confidence in participating in QI work (pre = 1.75 vs. post = 3.42 points,  $p < 0.0001$ ); and knowledge in communicating QI principles (pre = 1.89, post = 3.17,  $p < 0.0003$ ). Our educational programme uses the TDABC method and the residents' clinical experience effectively to teach residents cost-conscious care.

### **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.

**Ten Commandments for Neonatal-Perinatal Medicine Fellows**

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

**ABSTRACT:**

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

**A Cross-Specialty Examination of Resident Error Disclosure and Communication Skills Using Simulation**

Gardner AK, Lim G, Minard CG, Guffey D, Pillow MT. J Grad Med Educ. 2018 Aug;10(4):438-441. doi: 10.4300/JGME-D-17-00603.1.

**BACKGROUND:**

Disclosure of medical errors is important to patients and physicians, but formal disclosure training during the graduate medical education curriculum is limited.

**OBJECTIVE:**

We examined resident competence related to error disclosure, using standardized patient (SP) ratings of resident communication skills.

**METHODS:**

All first-year residents from medicine, radiology, emergency medicine, orthopedic surgery, and neurological surgery completed a 20-minute simulated session in which they were provided background information on a medical error they had made and were asked to disclose the error to an SP acting as a family member. Residents were then debriefed and completed a post-scenario questionnaire. The SPs completed an 11-item communication assessment and 3 milestone rating tools on professionalism (PROF-1, PROF-3) and interpersonal and communication skills (ICS-1).

**RESULTS:**

Ninety-six residents from a single institution participated toward the end of the intern year. Communication assessment scores ranged from 23% to 100% (mean [SD], 80.6 [17.0]). Mean (SD) milestone ratings across specialties were  $2.80 \pm 0.92$  for PROF-1,  $2.48 \pm 0.92$  for PROF-3, and  $2.45 \pm 0.92$  for ICS-1. One-way analysis of variance revealed no significant differences among specialties on milestone or communication ratings. Residents who accepted personal responsibility for the error (84.55 [14.06]) received significantly higher communication ratings from SPs compared with residents who did not (66.67 [19.52],  $P < .001$ ).

**CONCLUSIONS:**

This SP assessment of error disclosure by first-year residents from multiple specialties was feasible and acceptable. It revealed areas of improvement as well as considerable variation in communication skills and professionalism among residents.

## **Analysis of Milestone-Based End-of-Rotation Evaluations for Ten Residents Completing a Three-Year Anesthesiology Residency**

Chemtob CM, Tanaka P, Keil M, Macario A. *Cureus*. 2018 Aug 24;10(8):e3200. doi: 10.7759/cureus.3200.

### **INTRODUCTION:**

Faculty are required to assess the development of residents using educational milestones. This descriptive study examined the end-of-rotation milestone-based evaluations of anesthesiology residents by rotation faculty directors. The goals were to measure: (1) how many of the 25 Accreditation Council for Graduate Medical Education (ACGME) anesthesiology subcompetency milestones were included in each of the residency's rotations evaluations, (2) the percentage of evaluations sent to the rotation director that were actually completed by the director, (3) the length of time between the end of the residents' rotations and completion of the evaluations, (4) the frequency of straight line scoring, defined as the resident receiving the same milestone level score for all subcompetencies on the evaluation, and (5) how often a resident received a score below a Level 4 in at least one subcompetency in the three months prior to graduating.

### **METHODS:**

In 2013, the directors for each the 24 anesthesia rotations in the Stanford University School of Medicine Anesthesiology Residency Program created new milestone-based evaluations to be used at the end of rotations to evaluate residents. The directors selected the subcompetencies from the list released by the ACGME that were most appropriate for their rotation. End-of-rotation evaluations for the post graduate year (PGY)-2 to PGY-4 from July 1, 2014 to June 30, 2017 were retrospectively analyzed for a sample of 10 residents randomly selected from 22 residents in the graduating class.

### **RESULTS:**

The mean number of subcompetencies evaluated by each of the 24 rotations in the residency equaled 17.88 (standard deviation (SD): 3.39, range 10-24, median 18.5) from the available possible total of 25 subcompetencies. Three subcompetencies (medical knowledge, communication with patients and families, and coordination of patient care within the healthcare system) were included in the evaluation instruments of all 24 rotations. The three least frequently listed subcompetencies were: "acute, chronic, and cancer-related pain consultation/management" (25% of rotations had this on the end-of-rotation evaluation), "triage and management of critically ill patient in non-operative setting" (33%), and "education of patient, families, students, residents, and others" (38%). Overall, 418 end of rotation evaluations were issued and 341 (82%) completed, with 63% completed within one month, 22% between month one and two, and 15% after two months. The frequency of straight line scoring varied, from never occurring (0%) in three rotations to always occurring (100%) in two rotations, with an overall average of 51% (SD: 33%). Sixty-one percent of straight line scoring corresponded to the residents' postgraduate year whereby, for example, a post-graduate year two resident received an ACGME Level 2 proficiency for all subcompetencies. Thirty-one percent of the straight line scoring was higher than the resident's year of training (e.g., a PGY-2 received Level 3 or higher for all the subcompetencies). The remaining 7% of straight line scoring was below the expected level for the year of training. Three of seven residents had at least one subcompetency rated as below a Level 4 on one of the evaluations during the three months prior to finishing residency.

### **CONCLUSION:**

Formal analysis of a residency program's end-of-rotation milestone evaluations may uncover opportunities to improve competency-based evaluations.

**A Survey on Recent Medical School Graduate Comfort with the Level 1 Milestones**

Petravick ME, Marsh JL, Karam MD, Dirschl DR. J Surg Educ. 2018 Jul - Aug;75(4):911-917. doi: 10.1016/j.jsurg.2017.10.004. Epub 2017 Nov 7.

**OBJECTIVE:**

The Next Accreditation System implemented 5 levels of milestones for orthopedic surgery residents in 2013. The Level 1 milestones were noted as those "expected of an incoming resident." While the milestones were intended for assessing resident progression and readiness for independent practice, this designation can also be used to assess how well prepared graduating medical students are for beginning an orthopedic surgery residency. The primary objective of this paper is to measure recent medical school graduate comfort with the Level 1 milestones.

**DESIGN, SETTING, AND PARTICIPANTS:**

In June 2015, the program directors for the Midwest Orthopaedic Surgical Skills (MOSS) Consortium affiliated residency programs were sent an online survey for distribution to the recent medical school graduates who matched at their respective programs. The survey was about recent graduate comfort with the Level 1 milestone handles associated with 16 orthopedic milestones spanning multiple subspecialties. Responses were grouped based on comfort with individual milestone handles with orthopedic conditions (e.g., carpal tunnel) or with broader categories spanning orthopedic milestones (e.g., imaging).

**RESULTS:**

In all, 66 of 112 graduates (58.9%) responded. Of 60 milestone handles surveyed, respondents were "Comfortable" with an average of  $31.6 \pm 14.2$  handles with some conditions performing much better than others. The median "Comfortable" response rate was 31 handles. The 8 broader categories had "Comfortable" response rates between 35% and 70%. All 8 orthopedic conditions had significantly higher "Comfortable" response rates for "Evaluation & Knowledge" handles than for "Decision Making & Treatment" handles.

**CONCLUSIONS:**

Most recent medical student graduates who matched into an orthopedic surgery residencies are only comfortable with about half of the Level 1 milestone handles even though they are expected to meet the Level 1 milestones upon beginning residency. This finding suggests the development of an assessment based on the Level 1 milestones would be appropriate to better inform both graduate and undergraduate medical education in orthopedic surgery.

**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.



**Top Medical Education Studies of 2016: A Narrative Review**

Fromme HB, Ryan MS, Darden A, D'Alessandro DM, Mogilner L, Paik S, Turner TL. Acad Pediatr. 2018 Jul; 18(5):485-492. doi: 10.1016/j.acap.2018.01.015. Epub 2018 Feb 6.

**ABSTRACT:**

Education, like clinical medicine, should be based on the most current evidence in the field. Unfortunately, medical educators can be overwhelmed by the sheer volume and range of resources for this literature. This article provides an overview of 15 articles from 2016 that the authors consider the top articles in the field of pediatric medical education. The 7 authors, all medical educators with combined leadership and expertise across the continuum of pediatric medical education, used an iterative 3-stage process to review more than 6339 abstracts published in 2016. This process was designed to identify a small subset of articles that were most relevant to educational practices and most applicable to pediatric medical education. In the first 2 stages, pairs of authors independently reviewed and scored abstracts in 13 medical education-related journals and reached consensus to identify the articles that best met these criteria. In the final stage, all articles were discussed using a group consensus model to select the final articles included in this review. This article presents summaries of the 15 articles that were selected. The results revealed a cluster of studies related to observed standardized clinical encounters, self-assessment, professionalism, clinical teaching, competencies/milestones, and graduate medical education management strategies. We provide suggestions on how medical educators can apply the findings to their own practice and educational settings. This narrative review offers a useful tool for educators interested in keeping informed about the most relevant and valuable information in the field.

**Simple Frameworks for Daily Work: Innovative Strategies to Coach Residents Struggling with Time Management, Organization, and Efficiency**

DeKosky AS, Sedrak MS, Goren E, Dine CJ, Warburton KM. J Grad Med Educ. 2018 Jun;10(3): 325-330. doi: 10.4300/JGME-D-17-00756.1.

**BACKGROUND:**

Organization and efficiency are central to success on busy inpatient services and may be relevant to demonstrating certain milestones. Most residents adopt these skills by observing supervisors and peers. For some, this method of emulation and adaptation does not occur, with the potential for a negative effect on patient care and team morale. Information on effective strategies for remediating organization and efficiency deficits is lacking.

**OBJECTIVE:**

We explored the major themes of organization and efficiency referred to the University of Pennsylvania Department of Medicine Early Intervention and Remediation Committee (EIRC), and developed tools for their remediation.

**METHODS:**

Assessments of residents and fellows referred to the EIRC between July 2014 and October 2016 were reviewed for organization and efficiency deficits. Common areas were identified, and an iterative process of learner observations and expert input was used to develop remediation tools.

**RESULTS:**

Over a 2-year period, the EIRC developed remediation plans for 4% of residents (13 of 342 total residents), and for 1 internal medicine subspecialty fellow. Organization and efficiency was the primary or secondary deficit in more than half of those assessed. Most common deficiencies involved admitting a patient efficiently, performing effective prerounding, and composing daily progress notes/ presentations. Remediation tools that provided deconstruction of tasks to their most granular and reproducible components were effective in improving performance.

**CONCLUSIONS:**

Deficits in organization and efficiency can disproportionately affect resident performance and delay milestone achievement. Many residents would benefit from detailed frameworks and assistance with new approaches to basic elements of daily work.

**An Analysis of Residents' Self-Evaluation and Faculty-Evaluation in Internal Medicine Standardized Residency Training Program Using Milestones Evaluation System**

Zhang Y, Chu XT, Zeng XJ, Li H, Zhang FC, Zhang SY, Shen T. Zhonghua Nei Ke Za Zhi. 2018 Jun 1;57(6):440-445. doi: 10.3760/cma.j.issn.0578-1426.2018.06.009.

**OBJECTIVE:**

To assess the value of internal medicine residency training program at Peking Union Medical College Hospital (PUMCH), and the feasibility of applying revised Milestones evaluation system.

**METHODS:**

Postgraduate-year-one to four (PGY-1 to PGY-4) residents in PUMCH finished the revised Milestones evaluation scales in September 2017. Residents' self-evaluation and faculty- evaluation scores were calculated. Statistical analysis was conducted on the data.

**RESULTS:**

A total of 207 residents were enrolled in this cross-sectional study. Both self and faculty scores showed an increasing trend in senior residents. PGY-1 residents were assessed during their first month of residency with scores of 4 points or higher, suggesting that residents have a high starting level. More strikingly, the mean score in PGY-4 was 7 points or higher, proving the career development of residency training program. There was no statistically significant difference between total self- and faculty-evaluation scores. Evaluation scores of learning ability and communication ability were lower in faculty group ( $t=-2.627, -4.279$ , all  $P<0.05$ ). The scores in graduate students were lower than those in standardized training residents.

**CONCLUSIONS:**

The goal of national standardized residency training is to improve the quality of healthcare and residents' career development. The evaluation results would guide curriculum design and emphasize the importance and necessity of multi-level teaching. Self-evaluation contributes to the understanding of training objectives and personal cognition.

**Use of a Clinical Pathologic Conference to Demonstrate Residents' ACGME Emergency Medicine Milestones, Aid in Faculty Development, and Increase Academic Output**

Kane K, Weaver K, Barr G, Quinn S, Goyke T, Smith A, Yenser D, Kane B. J Am Osteopath Assoc. 2018 Jun 1;118(6):410-415. doi: 10.7556/jaoa.2018.085.

**ABSTRACT:**

The Emergency Medicine Milestones Project, developed by the Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Emergency Medicine, includes competence targets for residents to attain and, ultimately, to exceed American Osteopathic Association and ACGME expectations for residents. The authors sought to use the clinical pathologic conference (CPC) format in their institutions' Emergency Medicine Milestones Project to provide measurable residency academic and faculty development outcomes. The CPC is an event in which a resident presents an unknown case to a discussant in advance of a didactic session to demonstrate an organized approach and decision-making rationale to a differential diagnosis. Feedback forms included the assessment of resident discussants from the perspective of level-5 Milestone achievements in particular. Developing an internal CPC competition with a dedicated core faculty coordinator who provides skill development for both resident and faculty presentation has proven successful. Such a competition can document the level-5 achievements for senior residents, be a source of faculty development, and increase peer-reviewed academic output.

## **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.

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

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

**PURPOSE:**

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

**METHOD:**

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

**RESULTS:**

Of 612 total milestones, 249 (40.7%) made mention of QI/PS. A median 10 milestones per specialty (interquartile range, 5.25-11.75) mentioned QI/PS. There were 446 individual references to QI, 423 references to PS, and another 1,065 references to QI/PS-related concepts, including patient-centered care, cost-effective practice, documentation, equity, handoffs and care transitions, and teamwork.

QI/PS references reflected expectations about both individual-level practice (531/869, 61.1%) and practice within a healthcare system (338/869, 38.9%). QI and PS references were linked to all six ACGME core competencies.

**CONCLUSIONS:**

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



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

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

**OBJECTIVES:**

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

**DESIGN:**

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

**SETTING:**

Independent academic medical center.

**PARTICIPANTS:**

General surgery residents.

**RESULTS:**

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

**CONCLUSIONS:**

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

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

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

**ABSTRACT:**

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

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**Resident and Program Director's Perceptions of Milestone-Based Feedback in Obstetrics and Gynecology**

Hariton E, Bortoletto P, Barnes KL, Kaimal AJ, Stagg AR. J Med Educ Curric Dev. 2018 May 20;5:2382120518774794. doi: 10.1177/2382120518774794. eCollection 2018 Jan-Dec.

**INTRODUCTION:**

In July 2014, US residency programs fully implemented the Next Accreditation System including the use of milestone evaluation and reporting. Currently, there has been little investigation into the result of implementation of this new system. Therefore, this study sought to evaluate perceptions of Obstetrics and Gynecology residents and program directors regarding the use of milestone-based feedback and identify areas of deficiency.

**METHODS:**

A Web-based survey was sent to US-based Obstetrics and Gynecology residents and program directors regarding milestone-based assessment implementation.

**RESULTS:**

Out of 245 program directors, 84 responded to our survey (34.3% response rate). Of responding program directors, most reported that milestone-based feedback was useful (74.7%), fair (83.0%), and accurate (76.5%); however, they found it administratively burdensome (78.1%). Residents felt that milestone-based feedback was useful (62.7%) and fair (70.0%). About 64.3% of residents and 74.7% of program directors stated that milestone-based feedback is an effective tool to track resident progression; however, a sizable minority of both groups believe that it does not capture surgical aptitude. Qualitative analysis of free response comments was largely negative and highlighted the administrative burden and lack of accuracy of milestone-based feedback.

**CONCLUSION:**

Overall, both Obstetrics and Gynecology program directors and residents report that milestone-based feedback is useful and fair. Issues of administrative burden, timeliness, evaluation of surgical aptitude, and ability to act on assigned milestone levels were identified. Although this study is limited to one specialty, such issues are likely important to all residents, faculty, and program directors who have implemented the Next Accreditation System requirements.

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

Collichio F, Muchmore EA. Am Soc Clin Oncol Educ Book. 2018 May 23;(38):887-893. doi: 10.1200/EDBK\_201773.

**ABSTRACT:**

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

**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.

**Shadowing Emergency Medicine Residents by Medical Education Specialists to Provide Feedback on Non-Medical Knowledge-Based ACGME Sub-Competencies**

Waterbrook AL, Spear Ellinwood KC, Pritchard TG, Bertels K, Johnson AC, Min A, Stoneking LR. *Adv Med Educ Pract.* 2018 May 4;9:307-315. doi: 10.2147/AMEP.S151216. eCollection 2018.

**OBJECTIVE:**

Non-medical knowledge-based sub-competencies (multitasking, professionalism, accountability, patient-centered communication, and team management) are challenging for a supervising emergency medicine (EM) physician to evaluate in real-time on shift while also managing a busy emergency department (ED). This study examines residents' perceptions of having a medical education specialist shadow and evaluate their nonmedical knowledge skills.

**METHODS:**

Medical education specialists shadowed postgraduate year 1 and postgraduate year 2 EM residents during an ED shift once per academic year. In an attempt to increase meaningful feedback to the residents, these specialists evaluated resident performance in selected non- medical knowledge-based Accreditation Council of Graduate Medical Education (ACGME) sub- competencies and provided residents with direct, real-time feedback, followed by a written evaluation sent via email. Evaluations provided specific references to examples of behaviors observed during the shift and connected these back to ACGME competencies and milestones.

**RESULTS:**

Twelve residents participated in this shadow experience (six post graduate year 1 and six postgraduate year 2). Two residents emailed the medical education specialists ahead of the scheduled shadow shift requesting specific feedback. When queried, five residents voluntarily requested their feedback to be included in their formal biannual review. Residents received milestone scores and narrative feedback on the non-medical knowledge-based ACGME sub-competencies and indicated the shadow experience and subsequent feedback were valuable.

**CONCLUSION:**

Medical education specialists who observe residents over the course of an entire shift and evaluate non-medical knowledge-based skills are perceived by EM residents to provide meaningful feedback and add valuable information for the biannual review process.



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

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**Results from the Field: Development and Evaluation of a Psychiatry Residency Training Rotation in Cognitive-Behavioral Therapies**

Kamholz BW, Lawrence AE, Liverant GI, Black SK, Hill JM. Acad Psychiatry. 2018 Apr;42(2):228-232. doi: 10.1007/s40596-017-0720-6. Epub 2017 Jun 6.

**OBJECTIVE:**

The goal of this project was to develop and evaluate a new residency training rotation focused on cognitive-behavioral therapies (CBT) and to assess outcomes across multiple domains.

**METHODS:**

Data are presented from 30 psychiatry residents. Primary learning-related outcomes included content knowledge, self-efficacy, and attitudes and behavioral intentions towards evidence-based psychotherapies (e.g., CBT).

**RESULTS:**

Residents reported significant increases in CBT knowledge, CBT-specific self-efficacy, overall psychotherapy self-efficacy, belief in patient benefit from CBT, and behavioral intention to use CBT. However, there were almost no changes in attitudes towards evidence-based practice more broadly, with one significant finding showing an increase in skepticism towards such practices.

**CONCLUSIONS:**

This empirically based example of training program development, implementation, and evaluation appears largely successful and represents one approach for addressing the CBT competency goals outlined by the Accreditation Council for Graduate Medical Education (ACGME) and Milestone Project Guidelines. Despite these initial, positive findings, conclusions should be tempered by limitations of the project design (e.g., the lack of comparison group, absence of objective measures of resident behavioral change, or assessment of the effect of such changes on patient outcomes). Findings highlight the need for continued development and evaluation of training methods in CBT for residency programs.

**Education Research: The Current State of Neurophysiology Education in Selected Neurology Residency Programs**

Daniello KM, Weber DJ. *Neurology*. 2018 Apr 10;90(15):708-711. doi: 10.1212/WNL.0000000000005296.

**OBJECTIVE:**

Prior research has illustrated there is a knowledge gap in neurology residents' neurophysiology education (EEG and EMG), and we sought to understand whether this is still an issue and to recognize the barriers in order to create solutions and improve education.

**METHODS:**

Surveys were developed for adult neurology residents and one for program directors asking about confidence in neurophysiology knowledge, percent of graduates reaching level 4 ACGME (American Council of Graduate Medical Education) milestones in EEG and EMG, methods of learning used, interest in the subjects, and suggestions for improvements.

**RESULTS:**

Twenty-six program directors (19% responder rate) and 55 residents (from at least 16 different programs) completed the survey. Program directors thought that 85% of graduating residents met level 4 milestones in EEG and only 75% in EMG. Structured rotations and more time allocated to education of these topics were frequent barriers mentioned. Postgraduate year 4 residents were 60% and 67% confident in EEG and 64%, 59%, and 62.3% in EMG level 4 milestones. Learning to read EEGs was considered important throughout residents' training; however, this interest and value decreased over time with EMG.

**CONCLUSION:**

In our study, program directors suspect up to a quarter of residents may graduate not meeting level 4 ACGME milestones, and residents expressed lack of confidence in these areas. The educational methods used to instruct residents in EEG and EMG were similar as were the barriers they face across programs. This information hopefully will help fuel curriculum design and interest in these important neurology techniques.

**Interim Analysis of a Prospective Multi-Institutional Study of Surgery Resident Experience with Flexibility in Surgical Training**

Cullinan DR, Wise PE, Delman KA, Potts JR, Awad MM, Eberlein TJ, Klingensmith ME. *J Am Coll Surg*. 2018 Apr;226(4):425-431. doi: 10.1016/j.jamcollsurg.2017.12.024. Epub 2018 Jan 5.

**BACKGROUND:**

The Flexibility in Surgical Training (FIST) consortium project was designed to evaluate the feasibility and resident outcomes of optional subspecialty-focused training within general surgery residency training.

**STUDY DESIGN:**

After approval by the American Board of Surgery, R4 and R5 residents were permitted to customize up to 12 of the final 24 months of residency for early tracking into 1 of 9 subspecialty tracks. A prospective IRB-approved study was designed across 7 institutions to evaluate the impact of this option on operative experience, in-service exam (American Board of Surgery In-Training Examination [ABSITE]) and ACGME milestone performance, and resident and program director (PD) perceptions. The FIST residents were compared with chief residents before FIST initiation (controls) as well as residents during the study period who did not participate in FIST (no specialization track, NonS).

**RESULTS:**

From 2013 to 2017, 122 of 214 chief residents (57%) completed a FIST subspecialty track. There were no differences in median ABSITE scores between FIST, NonS residents, and controls. The ACGME milestones at the end of the R5 year favored the FIST residents in 13 of 16 milestones compared with NonS. Case logs demonstrated an increase in track-specific cases compared with NonS residents.

Resident and PD surveys reported a generally favorable experience with FIST.

**CONCLUSIONS:**

In this prospective study, FIST is a feasible option in participating institutions. All FIST residents, regardless of track, met requirements for ABS Board eligibility, despite modifications to rotations and case experience. Future studies will assess the impact of FIST on ABS exam results and fellowship success.

### **General Surgery Education across Three Continents**

McIlhenny C, Kurashima Y, Chan C, Hirano S, Domínguez-Rosado I, Stefanidis D. *Am J Surg.* 2018 Feb;215(2):209-213. doi: 10.1016/j.amjsurg.2017.12.002. Epub 2017 Dec 5.

#### **ABSTRACT:**

Surgical education has seen tremendous changes in the US over the past decade. The Halstedian training model of see one, do one, teach one that governed surgical training for almost 100 years has been replaced by the achievement of the ACGME competencies, milestones, entrustable professional activities (EPAs), and acquisition of surgical skill outside the operating room on simulators. Several of these changes in American medical education have been influenced by educators and training paradigms abroad. In this paper, we review the training paradigms for surgeons in the UK, Japan, and Mexico to allow comparisons with the US training paradigm and promote the exchange of ideas.

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

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

### **ABSTRACT:**

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

### **METHODOLOGY:**

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

### **RESULTS:**

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

### **CONCLUSION:**

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

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

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

**OBJECTIVES:**

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

**METHODS:**

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

**RESULTS:**

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

**CONCLUSIONS:**

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

**The Effect and Use of Milestones in the Assessment of Neurological Surgery Residents and Residency Programs**

Conforti LN, Yaghmour NA, Hamstra SJ, Holmboe ES, Kennedy B, Liu JJ, Waldo H, Selden NR. *J Surg Educ.* 2018 Jan - Feb;75(1):147-155. doi: 10.1016/j.jsurg.2017.06.001. Epub 2017 Jun 22.

**OBJECTIVES:**

The purpose of this study was to determine the effect of the Accreditation Council for Graduate Medical Education Milestones on the assessment of neurological surgery residents. The authors sought to determine the feasibility, acceptability, and utility of this new framework in making judgments of progressive competence, its implementation within programs, and the influence on curricula. Residents were also surveyed to elicit the effect of Milestones on their educational experience and professional development.

**DESIGN, SETTING, AND PARTICIPANTS:**

In 2015, program leadership and residents from 21 neurological surgery residency programs participated in an online survey and telephone interview in which they reflected on their experiences with the Milestones. Survey data were analyzed using descriptive statistics. Interview transcripts were analyzed using grounded theory.

**RESULTS:**

Response themes were categorized into 2 groups: outcomes of the Milestones implementation process, and facilitators and barriers. Because of Milestones implementation, participants reported changes to the quality of the assessment process, including the ability to identify struggling residents earlier and design individualized improvement plans. Some programs revised their curricula based on training gaps identified using the Milestones. Barriers to implementation included limitations to the adoption of a developmental progression model in the context of rotation block schedules and misalignment between progression targets and clinical experience. The shift from time-based to competency-based evaluation presented an ongoing adjustment for many programs. Organized preparation before clinical competency committee meetings and diverse clinical competency committee composition led to more productive meetings and perceived improvement in promotion decisions.

**CONCLUSIONS:**

The results of this study can be used by program leadership to help guide further implementation of the Milestones and program improvement. These results also help to guide the evolution of Milestones language and their implementation across specialties.



**A Program Director Survey of the Clinical Base Year in Anesthesiology Residency Programs**

Streiff A, Orlando B, Mahoney B. J Educ Perioper Med. 2018 Jan 1;20(1):E619. eCollection 2018 Jan- Mar.

**BACKGROUND:**

To maintain compliance with the current shift towards competency-based milestone assessment in graduate medical education, residency training programs must reflect this emphasis in their curricula starting with the intern year of training.<sup>1</sup> In working towards collaborative efforts in curricular development between Accreditation Council for Graduate Medical Education (ACGME) anesthesiology residency programs, understanding the structure and design of the clinical base year for anesthesiology residency programs nationwide will serve as a valuable initial step.

**METHODS:**

Anonymous online surveys were sent to anesthesiology residency program directors to collect data regarding their program's anesthesiology clinical base year (CBY) required, elective, and novel rotations. The survey was also designed to characterize the educational resources provided by the department, changes in the design of the clinical base year, and the feedback received from interns or other rotation department heads.

**RESULTS:**

Thirty-nine out of 130 US anesthesiology residency program directors responded (30%). The majority of respondents (87%) provide an in-house categorical intern CBY with a majority of those (94%) including a month dedicated to anesthesiology, during which some form of mentorship by anesthesiology faculty or senior house staff was provided. The majority of respondents with anesthesiology exposure stated that they provide educational resources such as textbook materials (82%) or simulation sessions (89%) to their residents.

**CONCLUSIONS:**

With the evolution of the role of the anesthesiologist, advancements in biotechnology, and newly created board examinations, it is imperative that the CBY prepares rising anesthesiology residents to meet these demands. Results from this survey study can serve as the initial step in improving the clinical base year structure for anesthesiology residents nationally. Collaborative efforts can be undertaken to better incorporate clinical competency, feedback mechanisms, and educational tools through the collection of experiential evidence of successful strategies as well as challenges faced by program directors nationwide.

**Positive Change in Feedback Perceptions and Behavior: A 10-Year Follow-up Study**

Balmer DF, Tenney-Soeiro R, Mejia E, Rezet B. *Pediatrics*. 2018 Jan;141(1). pii: e20172950. doi: 10.1542/peds.2017-2950. Epub 2017 Dec 7.

**BACKGROUND:**

Providing and learning from feedback are essential components of medical education, and typically described as resistant to change. But given a decade of change in the clinical context in which feedback occurs, the authors asked if, and how, perceptions of feedback and feedback behaviors might have changed in response to contextual affordances.

**METHODS:**

In 2017, the authors conducted a follow-up, ethnographic study on 2 general pediatric floors at the same children's hospital where another ethnographic study on a general pediatric floor was conducted in 2007. Data sources included (1) 21 and 34 hours of observation in 2007 and 2017, respectively, (2) 35 and 25 interviews with general pediatric attending physicians and residents in 2007 and 2017, respectively, and (3) a review of 120 program documents spanning 2007 to 2017. Data were coded and organized around 3 recommendations for feedback that were derived from 2007 data and served as standards for assessing change in 2017.

**RESULTS:**

Data revealed progress in achieving each recommendation. Compared with 2007, participants in 2017 more clearly distinguished between feedback and evaluation; residents were more aware of in-the-moment feedback, and they had shifted their orientation from evaluation and grades to feedback and learning. Explanations for progress in achieving recommendations, which were derived from the data, pointed to institutional and national influences, namely, the pediatric milestones.

**CONCLUSIONS:**

On the basis of follow-up, ethnographic data, changes in the clinical context of pediatric education may afford positive change in perceptions of feedback and feedback behavior and point to influences within and beyond the institution.

**Bringing the Flipped Classroom to Day 1: A Novel Didactic Curriculum for Emergency Medicine Intern Orientation**

Barrie MG, Amick C, Mitzman J, Way DP, King AM. West J Emerg Med. 2018 Jan;19(1):145- 147. doi: 10.5811/westjem.2017.11.35286. Epub 2017 Dec 18.

**ABSTRACT:**

Most emergency medicine (EM) residency programs provide an orientation program for their incoming interns, with the lecture being the most common education activity during this period. Our orientation program is designed to bridge the gap between undergraduate and graduate medical education by ensuring that all learners demonstrate competency on Level 1 Milestones, including medical knowledge (MK). To teach interns core medical knowledge in EM, we reformulated orientation using the flipped-classroom model by replacing lectures with small group, case-based discussions. Interns demonstrated improvement in medical knowledge through higher scores on a posttest. Evaluation survey results were also favorable for the flipped-classroom teaching format.

**Educational Resources for Resident Training in Quality Improvement: A National Survey of Urology Residency Program Directors**

Ziemba JB, Matlaga BR, Tessier CD. Urology practice. 2018;(5):398.

**INTRODUCTION:**

A key physician competency outlined in the Urology Milestone Project is engagement in quality improvement. Despite this mandate little is known about the attitudes of urology residency program directors regarding the relative importance of quality improvement education.

Therefore, we performed a national survey of program directors.

**METHODS:**

A 25-item survey was developed to investigate program director knowledge and training in quality improvement methodology, participation in quality improvement related activities, curriculum support for resident quality improvement educational activities, and attitudes regarding the relative importance of quality improvement education. The survey was sent via e-mail (November 1, 2016) to all program directors affiliated with the Society of Academic Urologists (sample size 116 of 134, 87% of Accreditation Council for Graduate Medical Education programs).

**RESULTS:**

A total of 36 program directors returned a completed survey for a response rate of 31%. Only 22% (8) of program directors reported receiving formal education or training in quality improvement methodology. Overall 44% (16) of program directors reported that their program offers formal education or a curriculum in quality improvement methodology for their trainees. Program directors expressed a strong desire for residents to learn quality improvement methodology (positive response 32 of 36, 89%) and understand how to apply it to conduct a quality improvement project (positive response 30 of 35, 86%). Program directors strongly believe that a urology oriented quality improvement curriculum would be a valuable resource (positive response 31 of 36, 86%) with a need for support from our professional society (positive response 29 of 36, 81%).

**CONCLUSIONS:**

A minority of programs have quality improvement education available for residents. However, program directors agree that quality improvement is an integral part of residency training that should be promoted by our profession.

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

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

**ABSTRACT:**

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

**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.

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

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**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.



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

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

**BACKGROUND:**

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

**PURPOSE:**

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

**STUDY SETTING:**

A major orthopedic specialty hospital and academic medical center.

**METHODS:**

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

**RESULTS:**

The independent review revealed objective deficits in both the orthopedic interns' history and the physical examination, as well as highlighted trends of inaccurate and incomplete documentation in the corresponding medical record. Communication skills with the patient did not meet expectations.

Further, interns tended to overscore themselves, especially with regard to their performance on the physical examination ( $p < .0005$ ). Inconsistencies, omissions, and inaccuracies were common in the corresponding medical notes when compared with the events of the patient encounter. Nine of the 13 interns (69.2%) documented at least one finding that was not assessed or tested in the clinical encounter, and four of the 13 interns (30.8%) included inaccuracies in the medical record, which contradicted the information collected at the time of the encounter.

**CONCLUSIONS:**

The results of this study highlighted significant shortcomings in the completeness of the interns' spine history and physical examination, and the accuracy and completeness of their EMR note. The study

**Point-of-Care Ultrasound in General Surgery Residency Training: A Proposal for Milestones in Graduate Medical Education Ultrasound**

Beal EW, Sigmond BR, Sage-Silski L, Lahey S, Nguyen V, Bahner DP. J Ultrasound Med. 2017 Dec;36(12):2577-2584. doi: 10.1002/jum.14298. Epub 2017 Jun 26.

**ABSTRACT:**

The use of point-of-care ultrasound (US) in the clinical setting has undergone massive growth, although its incorporation into training and practice is variable. Surgeons are interested in using point-of-care US and can incorporate it effectively into clinical practice. However, the current state of point-of-care US training in general surgery is inadequate. The Accreditation Council for Graduate Medical Education introduced the Milestones Project to evaluate resident and fellow performance. Emergency medicine is the only specialty with a point-of-care US milestone. We have successfully implemented a US training program into our general surgery residency curriculum and now propose milestones in point-of-care US for all general surgery residents.

**Two-Year Experience Implementing a Curriculum to Improve Residents' Patient-Centered Communication Skills**

Trickey AW, Newcomb AB, Porrey M, Piscitani F, Wright J, Graling P, Dort J. J Surg Educ. 2017 Nov - Dec;74(6):e124-e132. doi: 10.1016/j.jsurg.2017.07.014. Epub 2017 Jul 26.

**OBJECTIVES:**

Surgery milestones from The Accreditation Council for Graduate Medical Education have encouraged a focus on training and assessment of residents' nontechnical skills, including communication. We describe our 2-year experience implementing a simulation-based curriculum, results of annual communication performance assessments, and resident evaluations.

**DESIGN:**

Eight quarterly modules were conducted on various communication topics. Former patient volunteers served as simulation participants (SP) who completed annual assessments using the Communication Assessment Tool (CAT). During these 2 modules, communication skills were assessed in the following standardized scenarios: (1) delivering bad news to a caregiver of a patient with postoperative intracerebral hemorrhage and (2) primary care gallstone referral with contraindications for cholecystectomy. SP-CAT ratings were evaluated for correlations by individual and associations with trainee and SP characteristics. Surgical patient experience surveys are evaluated during the curriculum.

**SETTING:**

Independent academic medical center surgical simulation center.

**PARTICIPANTS:**

Twenty-five surgery residents per year in 2015 to 2017.

**RESULTS:**

Residents have practiced skills in a variety of scenarios including bad news delivery, medical error disclosure, empathic communication, and end-of-life conversations. Residents report positive learning experiences from the curriculum (90% graded all modules A/A+). Confidence ratings rose following each module ( $p < 0.001$ ) and in the second year ( $p < 0.001$ ). Annual assessments yielded insights into skills level, and relationships to resident confidence levels and traits. Communication scores were not associated with resident gender or postgraduate year. Over the course of the curriculum implementation, surgical patients have reported that doctors provided explanations with improved clarity ( $p = 0.042$ ).

**CONCLUSIONS:**

The simulation-based SP-CAT has shown initial evidence of usability, content validity, relationships to observed communication behaviors and residents' skills confidence. Evaluations of different scenarios may not be correlated for individuals over time. The communication curriculum paralleled improvements in patient experience concerning surgeons' clear explanations. An ongoing surgery resident communication curriculum has numerous educational, assessment, and institutional benefits.

## **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:**

There 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.

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

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

**BACKGROUND:**

The Accreditation Council for Graduate Medical Education and Plastic Surgery Milestone Project has identified practice-based learning and improvement, which involves systematically analyzing current practices and implementing changes, as a core competency in residency education. In surgical care, complication reporting is an essential component of practice-based learning and improvement as complications are analyzed in morbidity and mortality conference for quality improvement.

Unfortunately, current methods for capturing a comprehensive profile of complications may significantly underestimate the true occurrence of complications. Therefore, the objectives of this study are to evaluate an intervention for complication reporting and compare this to current practice, in a plastic surgery training program.

**METHODS:**

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

**RESULTS:**

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

**CONCLUSION:**

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

### **Graduate Medical Education Competencies for International Health Electives: A Qualitative Study**

Nordhues, Hannah C. Bashir, M. Usmaan, Merry, Stephen P., Sawatsky, Adam P. Medical Teacher; Nov2017, Vol. 39 Issue 11, p1128-1137, 10p

#### **BACKGROUND:**

Background: Residency programs offer international health electives (IHEs), providing multiple educational benefits. This study aimed to identify how IHEs fulfill the Accreditation Council for Graduate Medical Education (ACGME) core competencies.

#### **METHODS:**

We conducted a thematic analysis of post-rotation reflective reports from residents who participated in IHEs through the Mayo International Health Program. We coded reports using a codebook created from the ACGME competencies. Using a constant comparative method, we identified significant themes within each competency.

#### **RESULTS:**

Residents from 40 specialties participated in 377 IHEs in 56 countries from 2001 to 2014. Multiple themes were identified within each of the six ACGME core competencies: Patient Care and Procedural Skills (4), Medical Knowledge (5), Practice-Based Learning and Improvement (3), Interpersonal and Communication Skills (5), Professionalism (4), and Systems-Based Practice and Improvement (3).

Themes included improving physical exam and procedural skills, providing care in resource-limited setting, gaining knowledge of tropical and non-tropical diseases, identifying socioeconomic determinants of health, engaging in the education of others, and increasing communication across cultures and multidisciplinary teams.

#### **CONCLUSIONS:**

Through IHEs, residents advanced their knowledge, skills, and attitudes in each of the six ACGME competencies. These data can be used for development of IHE competencies and milestones for resident assessment.

## **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<sup>®</sup> (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.



### **Using the Teaching Perspectives Inventory as an Introduction to a Residents-as-Teachers Curriculum**

Robertson AC, Fowler LC, Juve AM. J Educ Perioper Med. 2017 Oct 1;19(4):E614. eCollection 2017 Oct-Dec.

#### **OBJECTIVE:**

The Anesthesiology Milestone Project includes a milestone for assessing the teaching attributes of residents within the competency of Practice-based Learning and Improvement. We intend to develop a Residents-as-Teachers educational curriculum to assist our residents in successfully achieving this milestone. The goal of this study is to identify the specific teaching perspectives and intentions of our residents and to promote residents' comprehension of their own teaching philosophy.

#### **METHODS:**

We invited our residents to complete the Teaching Perspective Inventory (TPI) and a follow-up survey to gather information regarding dominant and recessive teaching perspectives, their intended career pathway, and their view of the importance of understanding teaching perspectives.

#### **RESULTS:**

The two most common dominant teaching perspectives are apprenticeship and nurturing for residents who are planning a career in both academic medicine and private practice. A greater percentage of residents planning an academic career agree that identifying their teaching perspective is beneficial to their role as a clinical educator, compared to those anticipating a career in private practice.

#### **CONCLUSIONS:**

Based on this pilot data, our Residents-as-Teachers curriculum will include instruction of educational strategies specifically designed towards the apprenticeship and nurturing perspectives.

### **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.

**Towards Consensus: Training in Procedural Skills for Diagnostic Radiology Residents – Current Opinions of Residents and Faculty at a Large Academic Center**

Prater A, Rostad BS, Ebert EL, Mullins ME, Ho CP. *Curr Probl Diagn Radiol*. 2017 Oct 31. pii: S0363- 0188(17)30162-7. doi: 10.1067/j.cpradiol.2017.09.012.

**RATIONALE AND OBJECTIVES:**

The Diagnostic Radiology Milestones Project provides a framework for measuring resident competence in radiologic procedures, but there are limited data available to assist in developing these guidelines.

We performed a survey of current radiology residents and faculty at our institution as a first step toward obtaining data for this purpose. The survey addressed attitudes toward procedural standardization and procedures that trainees should be competent by the end of residency.

**MATERIALS AND METHODS:**

Current residents and faculty members were surveyed about whether or not there should be standardization of procedural training, in which procedures residents should achieve competency, and the number of times a procedure needs to be performed to achieve competency.

**RESULTS:**

Survey data were received from 60 study participants with an overall response rate of 32%. Sixty-five percent of respondents thought that procedural training should be standardized. Standardization of procedural training would include both the list of procedures that trainees should be competent in at the end of residency and the standard minimum number of procedures to achieve competency. Procedures that both residents and faculty agreed are important in which to achieve competency included central line/port procedures; CT-guided abdominal, thoracic, and musculoskeletal procedures; minor fluoroscopic-guided procedures; general fluoroscopy; peripheral line placements; and US-guided abdominal procedures. For most of these categories, most respondents believed that these procedures needed to be performed 6-20 times to achieve competency.

**CONCLUSION:**

Both resident and faculty respondents agreed that procedural training should be standardized during residency, and competence in specific procedures should be achieved at the completion of residency. Although this study is limited to a single institution, our data may provide assistance in developing future guidelines for standardizing image-guided procedure training. Future studies could be expanded to create a national consensus regarding the implementation of the Diagnostic Radiology Milestones Project.

**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.

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

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

**PURPOSE:**

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

**METHOD:**

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

**RESULTS:**

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

**CONCLUSIONS:**

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

**Mindfulness, Burnout, and Effects on Performance Evaluations in Internal Medicine Residents**

Braun SE, Auerbach SM, Rybarczyk B, Lee B, Call S. *Adv Med Educ Pract*. 2017 Aug 16;8:591- 597. doi: 10.2147/AMEP.S140554. eCollection 2017.

**PURPOSE:**

Burnout has been documented at high levels in medical residents with negative effects on performance. Some dispositional qualities, like mindfulness, may protect against burnout. The purpose of the present study was to assess burnout prevalence among internal medicine residents at a single institution, examine the relationship between mindfulness and burnout, and provide preliminary findings on the relation between burnout and performance evaluations in internal medicine residents.

**METHODS:**

Residents (n = 38) completed validated measures of burnout at three time points separated by 2 months and a validated measure of dispositional mindfulness at baseline. Program director end-of-year performance evaluations were also obtained on 22 milestones used to evaluate internal medicine resident performance; notably, these milestones have not yet been validated for research purposes; therefore, the investigation here is exploratory.

**RESULTS:**

Overall, 71.1% (n = 27) of the residents met criteria for burnout during the study. Lower scores on the "acting with awareness" facet of dispositional mindfulness significantly predicted meeting burnout criteria  $\chi^2(5) = 11.88, p = 0.04$ . Lastly, meeting burnout criteria significantly predicted performance on three of the performance milestones, with positive effects on milestones from the "system-based practices" and "professionalism" domains and negative effects on a milestone from the "patient care" domain.

**CONCLUSION:**

Burnout rates were high in this sample of internal medicine residents and rates were consistent with other reports of burnout during medical residency. Dispositional mindfulness was supported as a protective factor against burnout. Importantly, results from the exploratory investigation of the relationship between burnout and resident evaluations suggested that burnout may improve performance on some domains of resident evaluations while compromising performance on other domains. Implications and directions for future research are discussed.

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

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

**ABSTRACT**

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

**Science of Health Care Delivery Milestones for Undergraduate Medical Education**

Havyer RD, Norby SM, Leep Hunderfund AN, Starr SR, Lang TR, Wolanskyj AP, Reed DA. BMC Med Educ. 2017 Aug 25;17(1):145. doi: 10.1186/s12909-017-0986-0.

**BACKGROUND:**

The changing healthcare landscape requires physicians to develop new knowledge and skills such as high-value care, systems improvement, population health, and team-based care, which together may be referred to as the Science of Health Care Delivery (SHCD). To engender public trust and confidence, educators must be able to meaningfully assess physicians' abilities in SHCD. We aimed to develop a novel set of SHCD milestones based on published Accreditation Council for Graduate Medical Education (ACGME) milestones that can be used by medical schools to assess medical students' competence in SHCD.

**METHODS:**

We reviewed all ACGME milestones for 25 specialties available in September 2013. We used an iterative, qualitative process to group the ACGME milestones into SHCD content domains, from which SHCD milestones were derived. The SHCD milestones were categorized within the current ACGME core competencies and were also mapped to Association of American Medical Colleges' Entrustable Professional Activities (AAMC EPAs).

**RESULTS:**

Fifteen SHCD sub-competencies and corresponding milestones are provided, grouped within ACGME core competencies and mapped to multiple AAMC EPAs.

**CONCLUSIONS:**

This novel set of milestones, grounded within the existing ACGME competencies, defines fundamental expectations within SHCD that can be used and adapted by medical schools in the assessment of medical students in this emerging curricular area. These milestones provide a blueprint for SHCD content and assessment as ongoing revisions to milestones and curricula occur.



**Procedural Skills of the Entrustable Professional Activities: Are Graduating US Medical Students Prepared to Perform Procedures in Residency?**

Bruce AN, Kumar A, Malekzadeh S. J Surg Educ. 2017 Jul - Aug;74(4):589-595. doi: 10.1016/j.jsurg.2017.01.002. Epub 2017 Jan 23.

**PURPOSE:**

Competency-based medical education has been successfully instituted in graduate medical education through the development of Milestones. Consequently, the Association of American Medical Colleges implemented the core entrustable professional activities initiative to complement this framework in undergraduate medical education. We sought to determine its efficacy by examining the experiences and confidence of recent medical school graduates with general procedural skills (entrustable professional activities 12).

**METHOD:**

We administered an electronic survey to the MedStar Georgetown University Hospital intern class assessing their experiences with learning and evaluation as well as their confidence with procedural skills training during medical school. Simple linear regression was used to compare respondent confidence and the presence of formal evaluation in medical school.

**RESULTS:**

We received 28 complete responses, resulting in a 33% response rate, whereas most respondents indicated that basic cardiopulmonary resuscitation, bag/mask ventilation, and universal precautions were important to and evaluated by their medical school, this emphasis was not present for venipuncture, intravenous catheter placement, and arterial puncture. Mean summed scores of confidence for each skill indicated a statistically significant effect between confidence and evaluation of universal precaution skills.

**CONCLUSIONS:**

More advanced procedural skills are not considered as important for graduating medical students and are less likely to be taught and formally evaluated before graduation. Formal evaluation of some procedural skills is associated with increased confidence of the learner.

### **Simulation Training in Neurosurgery: Advances in Education and Practice**

Konakondla S, Fong R, Schirmer CM. *Adv Med Educ Pract.* 2017 Jul 14;8:465-473. doi: 10.2147/AMEP.S113565. eCollection 2017.

#### **ABSTRACT:**

The current simulation technology used for neurosurgical training leaves much to be desired. Significant efforts are thoroughly exhausted in hopes of developing simulations that translate to give learners the "real-life" feel. Though a respectable goal, this may not be necessary as the application for simulation in neurosurgical training may be most useful in early learners. The ultimate uniformly agreeable endpoint of improved outcome and patient safety drives these investments. We explore the development, availability, educational taskforces, cost burdens and the simulation advancements in neurosurgical training. The technologies can be directed at achieving early resident milestones placed by the Accreditation Council for Graduate Medical Education. We discuss various aspects of neurosurgery disciplines with specific technologic advances of simulation software. An overview of the scholarly landscape of the recent publications in the realm of medical simulation and virtual reality pertaining to neurologic surgery is provided. We analyze concurrent concept overlap between PubMed headings and provide a graphical overview of the associations between these terms.

**Miles Away Milestones: A Framework for Assessment of Pediatric Residents during Global Health Rotations**

Arora G, Condurache T, Batra M, Butteris SM, Downs T, Garfunkel L, Newcomer CA, Perkins KL, Schubert C, St Clair NE. *Acad Pediatr*. 2017 Jul;17(5):577-579. doi: 10.1016/j.acap.2016.12.018. Epub 2017 Jan 12.

**BACKGROUND:**

Participation in global health (GH) rotations offers trainees the opportunity to strengthen physical examination skills, medical knowledge, resource utilization, interpersonal and communication skills, humanism, and personal and professional development. The Association of Pediatric Program Directors (APPD) has recognized GH as an educational priority.

Approximately 58% of pediatric training programs offer GH rotations, and 25% have GH tracks. Despite the growth of resident participation in GH experiences, no standardized assessment tools have been adapted for use during GH rotations. The robust milestone framework used to evaluate pediatric trainees on stateside rotations may be cumbersome for those unfamiliar with the milestones framework; may provide culturally inaccurate descriptors of behaviors; and, if not applied during GH rotations, may result in a missed opportunity to capture the knowledge, skills, and attitudes acquired during GH rotations. To address these issues, a collaborative group developed a milestone-based framework for assessing trainees engaged in GH rotations.

**Entrustable Professional Activities for Pathology: Recommendations from the College of American Pathologists Graduate Medical Education Committee**

McCloskey CB, Domen RE, Conran RM, Hoffman RD, Post MD, Brissette MD, Gratzinger DA, Raciti PM, Cohen DA, Roberts CA, Rojiani AM, Kong CS, Peterson JEG, Johnson K, Plath S, Powell SZ. Acad Pathol. 2017 Jun 27;4:2374289517714283. doi: 10.1177/2374289517714283. eCollection 2017 Jan-Dec.

**ABSTRACT:**

Competency-based medical education has evolved over the past decades to include the Accreditation Council for Graduate Medical Education Accreditation System of resident evaluation based on the Milestones project. Entrustable professional activities represent another means to determine learner proficiency and evaluate educational outcomes in the workplace and training environment. The objective of this project was to develop entrustable professional activities for pathology graduate medical education encompassing primary anatomic and clinical pathology residency training. The Graduate Medical Education Committee of the College of American Pathologists met over the course of 2 years to identify and define entrustable professional activities for pathology graduate medical education. Nineteen entrustable professional activities were developed, including 7 for anatomic pathology, 4 for clinical pathology, and 8 that apply to both disciplines with 5 of these concerning laboratory management. The content defined for each entrustable professional activity includes the entrustable professional activity title, a description of the knowledge and skills required for competent performance, mapping to relevant Accreditation Council for Graduate Medical Education Milestone subcompetencies, and general assessment methods. Many critical activities that define the practice of pathology fit well within the entrustable professional activity model. The entrustable professional activities outlined by the Graduate Medical Education Committee are meant to provide an initial framework for the development of entrustable professional activity-related assessment and curricular tools for pathology residency training.

**Academic Remediation: Why Early Identification and Intervention Matters**

Rumack CM, Guerrasio J, Christensen A, Aagaard EM. Acad Radiol. 2017 Jun;24(6):730-733. doi: 10.1016/j.acra.2016.12.022. Epub 2017 Mar 23.

**ABSTRACT:**

At our institution, we have developed a remediation team of strong, focused experts who help us with struggling learners in making the diagnosis and then coaching on their milestone deficits. It is key for all program directors to recognize struggling residents because early recognition and intervention gives the resident the best chance of success.

**Practice Patterns of Sleep Otolaryngologists at Training Institutions in the United States**

Lam AS, Wise SK, Dedhia RC. *Otolaryngol Head Neck Surg.* 2017 Jun;156(6):1025-1031. doi: 10.1177/0194599816671699. Epub 2016 Sep 27.

**OBJECTIVE:**

To assess the practice characteristics of adult sleep otolaryngologists within US otolaryngology residency training programs. Study Design Cross-sectional online survey.

**SETTING:**

Otolaryngology residency training programs.

**SUBJECTS AND METHODS:**

Program directors from 106 otolaryngology training programs in the United States were contacted. Program directors were instructed to forward a survey to otolaryngologists within the institution who provided Accreditation Council for Graduate Medical Education (ACGME) Otolaryngology Milestone Project feedback in "sleep-disordered breathing." The survey assessed demographics, nonsurgical practices, and surgical/ procedural practices of adult sleep otolaryngologists. Data were collected and analyzed.

**RESULTS:**

Forty-six surveys met inclusion criteria, representing 40 of 106 (38%) programs. Ninety-three percent of respondents reported that residents gained a significant portion of their sleep medicine training from themselves (ie, the respondents), yet only 36% of respondents spent  $\geq 50\%$  of their time on sleep medicine/surgery. Forty-one percent reported being board certified in sleep, with 18% having completed an ACGME fellowship in sleep medicine. Respondents with board certification were more likely to spend greater portions of their practice on sleep medicine/surgery,  $\chi^2(3, n = 44) = 23.161$  ( $P < .001$ ), treat non-obstructive sleep apnea sleep disorders (13 of 18 vs 1 of 26,  $P < .001$ ), interpret polysomnograms (13 of 17 vs 1 of 15,  $P < .001$ ), and perform drug-induced sleep endoscopy,  $\chi^2(1, n = 43) = 5.43$ , ( $P = .02$ ). A similar pattern was seen with stratification by ACGME sleep medicine fellowship.

**CONCLUSION:**

This study highlights the variance in practice patterns among sleep otolaryngologists who instruct residents. Board certification and fellowship training in sleep medicine significantly influence breadth of trainee exposure to this field. The highly disparate trainee experiences to sleep otolaryngology across US programs require attention.

**Accrediting Graduate Medical Education in Psychiatry: Past, Present, and Future**

Johnson T, Nadyah JJ, Lang M, Shelton PG. *Psychiatr Q.* 2017 Jun;88(2):235-247. doi: 10.1007/s11126-016-9475-6.

**ABSTRACT:**

The current terminology, goals, and general competency framework systematically utilized in the education of residents regardless of specialty is almost unrecognizable and quite foreign to those who trained before 2010. For example, the clinical and professional expectations for physicians-in-training have been placed onto a developmental framework of milestones. The expectations required during training have been expanded to include leadership and team participation skills, proficiency in the use of information technology, systemsbased knowledge including respect of resources and cost of care, patient safety, quality improvement, population health and sensitivity to diversity for both individual and populations of patients. With these additions to physician training, the Accreditation Council for Graduate Medical Education (ACGME) hopes to remain accountable to the social contract between medicine and the public. With a focus on psychiatric practice, this article provides a general background and overview of the major overhaul of the accreditation process and educational goals for graduate medical education and briefly highlights possibilities for the future.

**Toward a Research Agenda for Competency-Based Medical Education**

Gruppen L, Frank JR, Lockyer J, Ross S, Bould MD, Harris P, Bhanji F, Hodges BD, Snell L, Ten Cate O; ICBME Collaborators. *Med Teach*. 2017 Jun;39(6):623-630. doi: 10.1080/0142159X.2017.1315065.

**ABSTRACT:**

Competency-based medical education (CBME) is both an educational philosophy and an approach to educational design. CBME has already had a broad impact on medical schools, residency programs, and continuing professional development in health professions around the world. As the CBME movement evolves and CBME programs are implemented, a wide range of emerging research questions will warrant scholarly examination. In this paper, we describe a proposed CBME research agenda developed by the International CBME Collaborators. The resulting framework includes questions about the meaning of key concepts of CBME and their implications for learners, faculty members, and institutional structures. Other research questions relate to the learning process, the meaning of entrustment decisions, fundamental measurement issues, and the nature and definition of standards. The exploration of these questions will help to solidify the theoretical foundation of CBME, but many issues related to implementation also need to be addressed. These pertain to, among other things, nurturing independent learning, assembling and using assessment results to make decisions about competence, structuring feedback, supporting remediation, and how best to evaluate the longer-term outcomes of CBME. High-quality research on these questions will require rigorous outcome measures with strong validity evidence. The complexity of CBME necessitates theoretical and methodological diversity. It also requires multi-institutional studies that examine effects at multiple levels, from the learner to the team, the institution, and the health care system. Such a framework of research questions can guide and facilitate scholarly discourse on the theoretical and practical body of knowledge related to competency-based health professions education.



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

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

### **BACKGROUND:**

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

### **METHODS:**

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

### **RESULTS:**

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

### **CONCLUSIONS:**

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

**Using the ACGME Milestones as a Handover Tool from Medical School to Surgery Residency**

Wancata LM, Morgan H, Sandhu G, Santen S, Hughes DT. J Surg Educ. 2017 May - Jun;74(3):519-529. doi: 10.1016/j.jsurg.2016.10.016. Epub 2016 Nov 28.

**OBJECTIVE:**

To map current medical school assessments for graduating students to the Accreditation Council for Graduate Medical Education (ACGME) milestones in general surgery, and to pass forward individual performance metrics on level 1 milestones to receiving residency programs.

**DESIGN:**

The study included 20 senior medical students who were accepted into surgery internship positions. Data from medical school performance assessments from the third-year surgery clerkship, fourth-year surgery rotations, fourth-year surgery boot camp, Clinical Competency Assessment Examination, and United States Medical Licensing Examination (USMLE) Step 1 and 2 examinations were used to map each student's competency assessments to the General Surgery Milestones based on a scoring system created and validated by independent assessors. This Milestones Assessment was then provided to each student's receiving program director.

**SETTING:**

The study was conducted at the University of Michigan Medical School, in Ann Arbor, Michigan.

**PARTICIPANTS:**

Fourth-year medical students entering into surgical internship.

**RESULTS:**

Of 16 Accreditation Council for Graduate Medical Education (ACGME) General Surgery Milestones subcompetencies, 12 were able to be evaluated with current medical school assessments. Of the 20 students, 11 met criteria for all the level 1 milestones and 9 needed improvement in at least 1 domain.

**Corrigendum to: Using the ACMGE Milestones as a Handover Tool from Medical School to Surgery**

Wancata LM, Morgan H, Sandhu G, Santen S, Hughes DT. J Surg Educ. 2018 Sep 11. pii: S1931-7204(18)30378-7. doi: 10.1016/j.jsurg.2018.05.012.

***No abstract available***

**Competency Milestones for Medical Students: Design, Implementation, and Analysis at One Medical School**

Lomis KD, Russell RG, Davidson MA, Fleming AE, Pettepher CC, Cutrer WB, Fleming GM, Miller BM. *Med Teach*. 2017 May;39(5):494-504. doi: 10.1080/0142159X.2017.1299924. Epub 2017 Mar 10.

**ABSTRACT:**

Competency-based assessment seeks to align measures of performance directly with desired learning outcomes based upon the needs of patients and the healthcare system. Recognizing that assessment methods profoundly influence student motivation and effort, it is critical to measure all desired aspects of performance throughout an individual's medical training. The Accreditation Council for Graduate Medical Education (ACGME) defined domains of competency for residency; the subsequent Milestones Project seeks to describe each learner's progress toward competence within each domain. Because the various clinical disciplines defined unique competencies and milestones within each domain, it is difficult for undergraduate medical education to adopt existing GME milestones language. This paper outlines the process undertaken by one medical school to design, implement and improve competency milestones for medical students. A team of assessment experts developed milestones for a set of focus competencies; these have now been monitored in medical students over two years. A unique digital dashboard enables individual, aggregate and longitudinal views of student progress by domain. Validation and continuous quality improvement cycles are based upon expert review, user feedback, and analysis of variation between students and between assessors. Experience to date indicates that milestone-based assessment has significant potential to guide the development of medical students.

## Using the Objective Structured Clinical Examination to Assess ACGME Competencies in Pediatric Gastroenterology Fellows

Solomon AB, Reed R, Benkov K, Kingsbery J, Lusman SS, Malter LB, Levine J, Rabinowitz SS, Wolff M, Zabar S, Weinshel E. *J Pediatr Gastroenterol Nutr.* 2017 Apr;64(4):e92-e95. doi: 10.1097/MPG.0000000000001450.

### BACKGROUND:

The Accreditation Council for Graduate Medical Education has described 6 core competencies with which trainees should demonstrate proficiency. Using the Objective Structured Clinical Examination (OSCE), we aimed to assess 4 of these competencies among Pediatric Gastrointestinal (GI) fellows (PGs).

### METHODS:

Eight first-year PGs from 6 medical centers in the New York area participated in a 4-station OSCE with trained standardized patient (SP) actors. The cases included an emergency department (ED) consult, or "ED Consult" for lower gastrointestinal bleeding; "Breaking Bad News" focusing on CF nutritional complications; "Second Opinion" for abdominal pain; "Transition of Care" for inflammatory bowel disease. At each station, attending faculty observed the encounters behind a 1-way mirror. SPs and faculties provided immediate feedback to the examined fellows. Previously validated OSCE checklists were used to assess performance. On completion, fellows attended debriefing sessions and completed surveys about the educational value.

### RESULTS:

Median overall milestone competency scores were 6.9 (PC1), 4.8 (PC2), 5.9 (MK1), 5.7 (MK2), 6.4 (ICS1), 6.9 (Prof1), and 6.7 (Prof3). Overall, fellows score highest (7/9) on the inflammatory bowel disease "Transition of Care" case, found the "Breaking Bad News" Cystic Fibrosis OSCE to be the most challenging, and were most comfortable with the "ED Consult" OSCE, as a commonly encountered scenario. Overall, the fellows rated the educational value of the program highly.

### CONCLUSIONS:

To our knowledge, although the OSCE has been validated in other medical fields, this is the first OSCE program developed for PGs fellows. These OSCEs have included Accreditation Council for Graduate Medical Education competencies, serving to assess fellows' skills in these areas while exposing them to challenging medical and psychosocial cases that they may not frequently encounter.

**Talk the Talk: Implementing a Communication Curriculum for Surgical Residents**

Newcomb AB, Trickey AW, Porrey M, Wright J, Piscitani F, Graling P, Dort J. *J Surg Educ.* 2017 Mar - Apr; 74(2):319-328. doi: 10.1016/j.jsurg.2016.09.009. Epub 2016 Nov 4.

**OBJECTIVES:**

The Accreditation Council for Graduate Medical Education milestones provide a framework of specific interpersonal and communication skills that surgical trainees should aim to master.

However, training and assessment of resident nontechnical skills remains challenging. We aimed to develop and implement a curriculum incorporating interactive learning principles such as group discussion and simulation-based scenarios to formalize instruction in patient-centered communication skills, and to identify best practices when building such a program.

**DESIGN:**

The curriculum is presented in quarterly modules over a 2-year cycle. Using our surgical simulation center for the training, we focused on proven strategies for interacting with patients and other providers. We trained and used former patients as standardized participants (SPs) in communication scenarios.

**SETTING:**

Surgical simulation center in a 900-bed tertiary care hospital.

**PARTICIPANTS:**

Program learners were general surgery residents (postgraduate year 1-5). Trauma Survivors Network volunteers served as SPs in simulation scenarios.

**RESULTS:**

We identified several important lessons: (1) designing and implementing a new curriculum is a challenging process with multiple barriers and complexities; (2) several readily available facilitators can ease the implementation process; (3) with the right approach, learners, faculty, and colleagues are enthusiastic and engaged participants; (4) learners increasingly agree that communication skills can be improved with practice and appreciate the curriculum value; (5) patient SPs can be valuable members of the team; and importantly (6) the culture of patient-physician communication appears to shift with the implementation of such a curriculum.

**CONCLUSIONS:**

Our approach using Trauma Survivors Network volunteers as SPs could be reproduced in other institutions with similar programs. Faculty enthusiasm and support is strong, and learner participation is active. Continued focus on patient and family communication skills would enhance patient care for institutions providing such education as well as for institutions where residents continue on in fellowships or begin their surgical practice.

### **Program Director Perceptions of the General Surgery Milestones Project**

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

#### **OBJECTIVE:**

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

#### **DESIGN, SETTING, AND PARTICIPANTS:**

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

#### **RESULTS:**

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

#### **CONCLUSIONS:**

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

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

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

**ABSTRACT:**

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

**Number of Weeks Rotating in the Emergency Department Has a Greater Effect on Ultrasound Milestone Competency than a Dedicated Ultrasound Rotation**

Smalley CM, Thiessen M, Bynny R, Dorey A, McNair B, Kendall JL. *J Ultrasound Med.* 2017 Feb;36(2):335-343. doi: 10.7863/ultra.15.12044. Epub 2016 Dec 10.

**OBJECTIVES:**

Ultrasound (US) is vital to modern emergency medicine (EM). Across residencies, there is marked variability in US training. The "goal-directed focused US" part of the Milestones Project states that trainees must correctly acquire and interpret images to achieve a level 3 milestone. Standardized methods by which programs teach these skills have not been established. Our goal was to determine whether residents could achieve level 3 with or without a dedicated US rotation.

**METHODS:**

Thirty-three first- and second-year residents were assigned to control (no rotation) and intervention (US rotation) groups. The intervention group underwent a 2-week curriculum in vascular access, the aorta, echocardiography, focused assessment with sonography for trauma, and pregnancy. To test acquisition, US-trained emergency medicine physicians administered an objective structured clinical examination. To test interpretation, residents had to identify normal versus abnormal findings. Mixed- model logistic regression tested the association of a US rotation while controlling for confounders: weeks in the emergency department (ED) as a resident, medical school US rotation, and postgraduate years.

**RESULTS:**

For image acquisition, medical school US rotation and weeks in the ED as a resident were significant ( $P = .03$ ;  $P = .04$ ) whereas completion of a US rotation and postgraduate years were not significant. For image interpretation, weeks in the ED as a resident was the only significant predictor of performance ( $P = .002$ ) whereas completion of a US rotation and medical school US rotation were not significant.

**CONCLUSIONS:**

To achieve a level 3 milestone, weeks in the ED as a resident were significant for mastering image acquisition and interpretation. A dedicated US rotation did not have a significant effect. A medical school US rotation had a significant effect on image acquisition but not interpretation. Further studies are needed to best assess methods to meet US milestones.



## **Integrating Quality Improvement Education into the Nephrology Curricular Milestones Framework and the Clinical Learning Environment Review**

Prince LK, Little DJ, Schexneider KI, Yuan CM. Clin J Am Soc Nephrol. 2017 Feb 7;12(2):349- 356. doi: 10.2215/CJN.04740416. Epub 2016 Nov 10.

### **ABSTRACT:**

The Accreditation Council for Graduate Medical Education requires that trainees show progressive milestone attainment in the practice-based learning and systems-based practice competencies. As part of the Clinical Learning Environment Review, sponsoring hospitals must educate trainees in health care quality improvement, provide them with specialty-specific quality data, and ensure trainee participation in quality improvement activities and committees.

Subspecialty-specific quality improvement curricula in nephrology training programs have not been reported, although considerable curricular and assessment material exists for specialty residencies, including tools for assessing trainee and faculty competence. Nephrology-specific didactic material exists to assist nephrology fellows and faculty mentors in designing and implementing quality improvement projects. Nephrology is notable among internal medicine subspecialties for the emphasis placed on adherence to quality thresholds—specifically for chronic RRT shown by the Centers for Medicare and Medicaid Services Quality Incentive Program. We have developed a nephrology-specific curriculum that meets Accreditation Council for Graduate Medical Education and Clinical Learning Environment Review requirements, acknowledges regulatory quality improvement requirements, integrates with ongoing divisional quality improvement activities, and has improved clinical care and the training program. In addition to didactic training in quality improvement, we track trainee compliance with Kidney Disease Improving Global Outcomes CKD and ESRD quality indicators (emphasizing Quality Improvement Program indicators), and fellows collaborate on a yearly multidisciplinary quality improvement project. Over the past 6 years, each fellowship class has, on the basis of a successful quality improvement project, shown milestone achievement in Systems-Based Practice and Practice-Based Learning. Fellow quality improvement projects have improved nephrology clinical care within the institution and introduced new educational and assessment tools to the training program. All have been opportunities for quality improvement scholarship.

The curriculum prepares fellows to apply quality improvement principals in independent clinical practice—while showing milestone advancement and divisional compliance with Clinical Learning Environment Review requirements.

**Milestones and Millennials: A Perfect Pairing-Competency-Based Medical Education and the Learning Preferences of Generation Y**

Desy JR, Reed DA, Wolanskyj AP. Mayo Clin Proc. 2017 Feb;92(2):243-250. doi: 10.1016/j.mayocp.2016.10.026.

**ABSTRACT:**

Millennials are quickly becoming the most prevalent generation of medical learners. These individuals have a unique outlook on education and have different preferences and expectations than their predecessors. As evidenced by its implementation by the Accreditation Council for Graduate Medical Education in the United States and the Royal College of Physicians and Surgeons in Canada, competency based medical education is rapidly gaining international acceptance. Characteristics of competency based medical education can be perfectly paired with Millennial educational needs in several dimensions including educational expectations, the educational process, attention to emotional quotient and professionalism, assessment, feedback, and intended outcomes. We propose that with its attention to transparency, personalized learning, and frequent formative assessment, competency based medical education is an ideal fit for the Millennial generation as it realigns education and assessment with the needs of these 21st century learners.

**Piloting the Mobile Medical Milestones Application (M3App©): A Multi-Institution Evaluation**

Page C, Reid A, Coe CL, Beste J, Fagan B, Steinbacher E, Newton WP. Fam Med. 2017 Jan;49(1):35- 41.

**BACKGROUND AND OBJECTIVES:**

Competency-based evaluation of the Accreditation Council for Graduate Medical Education (ACGME) Milestones requires the development of new evaluation tools that can better capture learners' behavior. This study describes the implementation and initial assessment of an innovative point-of-care mobile application, the M3App©, linked to the Family Medicine Milestones.

**METHODS:**

Seven family medicine residency programs in North Carolina implemented the M3App.© Program faculty and residents were surveyed prior to implementation regarding current evaluation methods and their quality and use and acceptability of electronic evaluation tools. Surveys were repeated after implementation for comparison.

**RESULTS:**

All seven programs successfully implemented the M3App. Most faculty members found the tool well designed, easy to use, beneficial to the quality and efficiency of feedback they provide, and to their knowledge of Milestones. Residents reported significant increases in the volume and quality of written feedback they receive.

**CONCLUSIONS:**

The M3App provides an efficient, convenient tool for assessing Milestones that can improve the quantity and quality of feedback residents receive from faculty. Improved faculty perception of knowledge of Milestones after M3App implementation suggests that the tool is also effective for faculty development.

**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.

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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.

**Simulation Based Medical Education in Graduate Medical Education Training and Assessment Programs**

Kothari LG, Shah K, Barach P. *Progress in Pediatric cardiology*. 2017:33. doi:10.1016/j.ppedcard.2017.02.001.

**ABSTRACT:**

The healthcare system has an inconsistent record of ensuring reliable and safe patient outcomes. One of the main factors contributing to this poor record is inadequate and unreliable interdisciplinary team behavior. Learning how to function within an interdisciplinary team must begin early in medical training. Simulation based medical education (SBME) is an essential part of graduate medical education (GME) training, the acquisition of core competencies and their assessment. In this paper, we describe SBME as it relates to learning and professional maturation. We describe the use of simulation in GME training, link simulation to the ACGME professional core competencies, present examples of simulation assessment methods, and explore simulation as part of board certification and professional life long learning. We discuss the important benefits of simulation for hospitals and patient safety. We summarize the literature on cost effectiveness of simulation in education and the growing evidence that SBME translates to improvements in communication, teamwork and clinical care and the overall improvement of healthcare. We discuss the challenges and costs required to develop a successful simulation and training center, lab or in-situ program. We discuss the return on investment of SBME as it relates to patient safety, cost savings, and improved patient care. Hospitals should embrace simulation based medical education and support the development of simulation centers so that SBME becomes an integral part of the hospitals' mission to provide patients with the best care possible.

**Domains, Competencies, EPAs, and Training Guidelines: A Primer on Developments in Pediatric Cardiology Education**

Frank LH. Progress in Pediatric cardiology. 2017. doi:10.1016/j.ppedcard.2017.01.002.

**ABSTRACT:**

Competency-based medical education has been a part of graduate medical education for over 15 years. The Pediatric Milestone Project and Entrustable Professional Activities have created new concepts to understand and apply. Parallel to these developments, pediatric cardiologists have collaborated to refine fellowship training guidelines.

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

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

### **OBJECTIVES:**

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

### **METHODS**

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

### **RESULTS**

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

### **CONCLUSIONS**

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



**Emergency Medicine Resident Orientation: How Training Programs Get their Residents Started**

McGrath J, Barrie M, Way DP, Western Journal of Emergency Medicine, Vol 18, Iss 1, Pp 97-104 (2017)

**INTRODUCTION:**

The first formal orientation program for incoming emergency medicine (EM) residents was started in 1976. The last attempt to describe the nature of orientation programs was by Brillman in 1995. Now almost all residencies offer orientation to incoming residents, but little is known about the curricular content or structure of these programs. The purpose of this project was to describe the current composition and purpose of EM resident orientation programs in the United States.

**METHODS:**

In autumn of 2014, we surveyed all U.S. EM residency program directors (n=167). We adapted our survey instrument from one used by Brillman (1995). The survey was designed to assess the orientation program's purpose, structure, content, and teaching methods.

**RESULTS:**

The survey return rate was 63% (105 of 167). Most respondents (77%) directed three-year residencies, and all but one program offered intern orientation. Orientations lasted an average of nine clinical (Std. Dev.=7.3) and 13 non-clinical days (Std. Dev.=9.3). The prototypical breakdown of program activities was 27% lectures, 23% clinical work, 16% skills training, 10% administrative activities, 9% socialization and 15% other activities. Most orientations included activities to promote socialization among interns (98%) and with other members of the department (91%). Many programs (87%) included special certification courses (ACLS, ATLS, PALS, NRP). Course content included the following: use of electronic medical records (90%), physician wellness (75%), and chief complaint- based lectures (72%). Procedural skill sessions covered ultrasound (94%), airway management (91%), vascular access (90%), wound management (77%), splinting (67%), and trauma skills (62%).

**CONCLUSION:**

Compared to Brillman (1995), we found that more programs (99%) are offering formal orientation and allocating more time to them. Lectures remain the most common educational activity. We found increases in the use of skills labs and specialty certifications. We also observed increases in time dedicated to clinical work during orientation. Only a few programs reported engaging in baseline or milestone assessments, an activity that could offer significant benefits to the residency program.

**National Survey of US Academic Anesthesiology Chairs on Clinician Wellness**

Vinson AE, Zurakowski D, Randel GI, Schlecht KD. J Clin Anesth. 2016 Nov;34:623-31. doi: 10.1016/j.jclinane.2016.06.015. Epub 2016 Aug 2.

**STUDY OBJECTIVE:**

The prevalence of anesthesiology department wellness programs is unknown. A database of wellness programs is needed as a resource for departments attempting to respond to the Accreditation Council for Graduate Medical Education Anesthesiology Milestones Project. The purpose of this study was to survey academic anesthesiology chairs on wellness issues, characterize initiatives, and establish wellness contacts for a Wellness Initiative Database (WID).

**DESIGN:**

An Internet-based survey instrument was distributed to academic anesthesiology department chairs in the United States.

**SETTING:**

On-line.

**PATIENTS:**

None.

**INTERVENTIONS:**

None.

**MEASUREMENTS:**

Analysis for continuous variables used standard means, modes, and averages for individual responses; 95% confidence intervals for proportions were calculated by Wilson's method.

**MAIN RESULTS:**

Seventy-five (56.4%) responses (of a potential 133 programs) were obtained. Forty-one (of 71 responders; 57.8%) expressed interest in participating in a WID, and 33 (44%) provided contact information. Most (74.7%) had recently referred staff for counseling or wellness resources, yet many (79.5% and 67.1%, respectively) had never surveyed their department's interest in wellness resources. Thirty-four percent had a wellness resources repository. Of 22 wellness topics, 8 garnered >60% strong interest from respondents: Addiction Counseling, Sleep Hygiene, Peer Support Program, Stress Management, Conflict Management, Burnout Counseling, Time Management, and Dealing with Adverse Events Training. There was a statistically significant difference in interest between those willing to participate or not in the WID across most topics but no significant difference based on need for recent staff referral.

**CONCLUSIONS:**

The majority of chairs needed to recently refer a department member to wellness resources or counseling. Most were interested in participating in a WID, whereas a minority had gauged staff interest in wellness topics or had a wellness resource repository. Highest interest was in topics most related to function as an anesthesiologist. Those willing to participate in the database had statistically significant differences in interest across most wellness topics.

**Goal-directed Focused Ultrasound Milestones Revised: A Multiorganizational Consensus**

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

**ABSTRACT:**

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

### **Patients, Nurses, and Physicians Working Together to Develop a Discharge Entrustable Professional Activity Assessment Tool**

Meade LB, Suddarth KH, Jones RR, Zaas AK, Albanese T, Yamazaki K, O'Malley CW. Acad Med. 2016 Oct;91(10):1388-1391.

#### **PROBLEM:**

The Accreditation Council for Graduate Medical Education milestones were written by physicians and thus may not reflect all the behaviors necessary for physicians to optimize their performance as a key member of an interprofessional team.

#### **APPROACH:**

From April to May 2013, the authors, Educational Research Outcomes Collaborative leaders, assembled interprofessional team discussion groups, including patients or family members, nurses, physician trainees, physician educators, and other staff (optional), at 11 internal medicine (IM) programs. Led by the site's principal investigator, the groups generated a list of physician behaviors related to the entrustable professional activity (EPA) of a safe and effective discharge of a patient from the hospital, and prioritized those behaviors.

#### **OUTCOMES:**

A total of 182 behaviors were listed, with lists consisting of between 10 and 29 behaviors. Overall, the site principal investigators described all participants as emerging from the activity with a new understanding of the complexity of training physicians for the discharge EPA. The authors batched behaviors into six components of a safe and effective discharge: medication reconciliation, discharge summary, patient/caregiver communication, team communication, active collaboration, and anticipation of posthospital needs. Specific, high-priority behavior examples for each component were identified, and an assessment tool for direct observation was developed for the discharge EPA.

#### **NEXT STEPS:**

The authors are currently evaluating trainee and educator perceptions of the assessment tool after implementation in 15 IM programs. Additional next steps include developing tools for other EPAs, as well as a broader evaluation of patient outcomes in the era of milestone-based assessment.

**Using Milestones as Evaluation Metrics during an Emergency Medicine Clerkship**

Quinn SM, Worriolow CC, Jayant DA, Bailey B, Eustice E, Kohlhepp J, Rogers R, Kane BG. J Emerg Med. 2016 Oct;51(4):426-431.

**BACKGROUND:**

The Accreditation Council for Graduate Medical Education's (ACGME) Milestones presumes graduating medical students will enter residency proficient at Milestone level 1 for 23 skills. The Next Accreditation System now includes Milestones for each postgraduate specialty, and it is unlikely that schools will document every emergency medicine (EM) applicant's EM-specific skills in their performance evaluation.

**OBJECTIVES:**

The goals of this research were to determine if assessment of the Milestones was feasible during a medical student clerkship and examine the proportion of medical students performing at Milestone level 1.

**METHODS:**

This study was conducted at a center with Liaison Committee on Medical Education-approved medical training and a 4-year EM residency. Using traditional clerkship, we studied the feasibility of an ACGME EM Milestones-based clerkship assessment. Data led to redesign of the clerkship and its evaluation process, including all level 1 anchor(s) to add "occasionally" (>60%), "usually" (>80%), and "always" (100%) on a Likert scale to on-shift assessment forms.

**RESULTS:**

During the feasibility phase (2013-14), 75 students rotated through the clerkship; 55 evaluations were issued and 50 contained the Milestone summary. Eight deficiencies were noted in Milestone 12 and three in Milestone 14. After changes, 49 students rotated under the new evaluation rubric. Of 575 completed on-shift evaluations, 16 Milestone deficiencies were noted. Of 41 institutional evaluations issued, only one student had deficiencies noted, all of which pertained to patient care. All evaluations in this second cohort contained each student's Milestone proficiency.

**CONCLUSIONS:**

Assessment of the Milestones is feasible. Communication of ACGME EM Milestone proficiency may identify students who require early observation or remediation. The majority of students meet the anchors for the Milestones, suggesting that clerkship assessment with the ACGME EM Milestones does not adequately differentiate students.

## **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.

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

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

#### **OBJECTIVE:**

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

#### **METHODS:**

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

#### **CONCLUSION:**

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

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

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

**ABSTRACT:**

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



**Genetic Counseling Milestones: A Framework for Student Competency Evaluation**

Guy C. J Genet Couns. 2016 Aug;25(4):635-43. doi: 10.1007/s10897-015-9895-8. Epub 2015 Oct 14.

**ABSTRACT:**

Graduate medical education has recently increased focus on the development of medical specialty competency milestones to provide a targeted tool for medical resident evaluation. Milestones provide developmental assessment of the attainment of competencies over the course of an educational program. An educational framework is described to explore the development of Genetic Counseling Milestones for the evaluation of the development of genetic counseling competencies by genetic counseling students. The development of Genetic Counseling Milestones may provide a valuable tool to assess genetic counseling students across all program activities. Historical educational context, current practices, and potential benefits and challenges in the development of Genetic Counseling Milestones are discussed.

**What Is a Rheumatologist and How Do We Make One?**

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

**OBJECTIVE:**

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

**METHODS:**

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

**RESULTS:**

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

**CONCLUSION:**

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

**Musculoskeletal Ultrasound Training for Radiology Residents: Lecture versus Interactive Learning Module**

Maloney E, Hippe DS, Paladin A, Chew FS, Ha AS. Acad Radiol. 2016 Jul;23(7):789-96. doi: 10.1016/j.acra.2015.11.018. Epub 2016 Apr 8.

**RATIONALE AND OBJECTIVES:**

A prospective randomized study was conducted to assess whether an electronic learning module was as effective as a didactic lecture to teach musculoskeletal ultrasound to radiology residents.

**MATERIALS AND METHODS:**

Thirty-three residents were randomized into a module group versus a didactic group. All residents took a written "pretest" to assess baseline knowledge. Subsequently, the 17 residents in the didactic group attended a live didactic session delivered by a subspecialist musculoskeletal radiology faculty member. The 16 residents in the module group completed an electronic learning module that contained similar content to the live didactic session. Finally, all residents completed a written "posttest," which served as the outcome measure.

**RESULTS:**

Mean score significantly improved between pre- and posttest by  $10.6 \pm 11.2\%$  in the didactic group (DG;  $P = 0.002$ ) and  $14.0 \pm 8.2\%$  in the module group (MG;  $P < 0.001$ ), with a nonsignificant difference between groups ( $P = 0.4$ ). Mean pretest scores ( $75.6 \pm 9.4\%$  DG and  $73.7 \pm 9.2\%$  MG,  $P = 0.6$ ) and posttest scores ( $86.2 \pm 9.7\%$  DG and  $87.7 \pm 5.2\%$  MG,  $P = 0.5$ ) were not significantly different. The adjusted mean difference in posttest scores between groups was  $-1.9\%$  (95% confidence interval:  $-7.2$  to  $3.5\%$ ).

**CONCLUSION:**

If didactic training was better than electronic module training, the difference was relatively small ( $<5\%$ ). A similar web-based, interactive module could be employed to teach American Board of Radiology Core Examination and Accreditation Council for Graduate Medical Education (ACGME) Diagnostic Radiology Milestone musculoskeletal ultrasound learning objectives to radiology residents. An electronic module could reduce demands on faculty staff time invested in musculoskeletal ultrasound training and be more widely available to residents.

**To the Point: Integrating Patient Safety Education into the Obstetrics and Gynecology Undergraduate Curriculum**

Abbott JF, Pradhan A, Buery-Joyner S, Casey PM, Chuang A, Dugoff L, Dalrymple JL, Forstein DA, Hampton BS, Hueppchen NA, Kaczmarczyk JM, Katz NT, Nuthalapaty FS, Page-Ramsey S, Wolf A, Cullimore AJ; APGO Undergraduate Medical Education Committee. *J Patient Saf.* 2016 Jul 26.

**ABSTRACT:**

This article is part of the To the Point Series prepared by the Association of Professors of Gynecology and Obstetrics Undergraduate Medical Education Committee. Principles and education in patient safety have been well integrated into academic obstetrics and gynecology practices, although progress in safety profiles has been frustratingly slow. Medical students have not been included in the majority of these ambulatory practice or hospital-based initiatives. Both the Association of American Medical Colleges and Accreditation Council for Graduate Medical Education have recommended incorporating students into safe practices. The Accreditation Council for Graduate Medical Education milestone 1 for entering interns includes competencies in patient safety. We present data and initiatives in patient safety, which have been successfully used in undergraduate and graduate medical education. In addition, this article demonstrates how using student feedback to assess sentinel events can enhance safe practice and quality improvement programs. Resources and implementation tools will be discussed to provide a template for incorporation into educational programs and institutions.

Medical student involvement in the culture of safety is necessary for the delivery of both high- quality education and high-quality patient care. It is essential to incorporate students into the ongoing development of patient safety curricula in obstetrics and gynecology.

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

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

**RATIONALE AND OBJECTIVES:**

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

**MATERIALS AND METHODS:**

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

**RESULTS:**

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

**CONCLUSIONS:**

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

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

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

**RATIONALE AND OBJECTIVES:**

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

**MATERIALS AND METHODS:**

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

**RESULTS:**

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

**CONCLUSION:**

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

**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.

**Shortening the Miles to the Milestones: Connecting EPA-Based Evaluations to ACGME Milestone Reports for Internal Medicine Residency Programs**

Choe JH, Knight CL, Stiling R, Corning K, Lock K, Steinberg KP. Acad Med. 2016 Jul;91(7):943- 50. doi: 10.1097/ACM.0000000000001161.

**ABSTRACT:**

The Next Accreditation System requires internal medicine training programs to provide the Accreditation Council for Graduate Medical Education (ACGME) with semiannual information about each resident's progress in 22 subcompetency domains. Evaluation of resident "trustworthiness" in performing entrustable professional activities (EPAs) may offer a more tangible assessment construct than evaluations based on expectations of usual progression toward competence. However, translating results from EPA-based evaluations into ACGME milestone progress reports has proven to be challenging because the constructs that underlay these two systems differ. The authors describe a process to bridge the gap between rotation-specific EPA-based evaluations and ACGME milestone reporting. Developed at the University of Washington in 2012 and 2013, this method involves mapping EPA-based evaluation responses to "milestone elements," the narrative descriptions within the columns of each of the 22 internal medicine subcompetencies. As faculty members complete EPA-based evaluations, the mapped milestone elements are automatically marked as "confirmed." Programs can maintain a database that tallies the number of times each milestone element is confirmed for a resident; these data can be used to produce graphical displays of resident progress along the internal medicine milestones. Using this count of milestone elements allows programs to bridge the gap between faculty assessments of residents based on rotation-specific observed activities and semiannual ACGME reports based on the internal medicine milestones. Although potentially useful for all programs, this method is especially beneficial to large programs where clinical competency committee members may not have the opportunity for direct observation of all residents.



**A Survey of Ultrasound Milestone Incorporation into Emergency Medicine Training Programs**

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

**OBJECTIVES:**

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

**METHODS:**

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

**RESULTS:**

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

**CONCLUSIONS:**

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

### **Teaching and Assessing Ethics in the Newborn ICU**

Cummings CL. *Semin Perinatol*. 2016 Jun;40(4):261-9. doi: 10.1053/j.semperi.2015.12.016. Epub 2016 Jan 29.

#### **ABSTRACT:**

Ethics and professionalism education has become increasingly recognized as important and incorporated into graduate medical education. However, such education has remained largely unstructured and understudied in neonatology. Neonatal-perinatal fellowship training programs have generally grappled with how best to teach and assess ethics and professionalism knowledge, skills, and behavior in clinical practice, particularly in light of accreditation requirements, milestones, and competencies. This article reviews currently available teaching methods, pedagogy, and resources in medical ethics, professionalism, and communication, as well as assessment strategies and tools, to help medical educators and practicing clinicians ensure trainees achieve and maintain competency. The need for consensus and future research in these domains is also highlighted.

**Observing and Giving Feedback to Novice PGY-1s**

Tully K, Keller J, Blatt B, Greenberg L. South Med J. 2016 May;109(5):320-5. doi: 10.14423/SMJ.0000000000000459.

**OBJECTIVES:**

In this new era of educational milestones and entrustable professional activities, residency programs have recognized the need to directly observe resident performance. In fact, there is little information about how often residents are observed, what procedures they perform early in training, and whether they receive feedback. Previous publications have addressed these issues exclusively through retrospective survey analyses. The purpose of this naturalistic point-of-care study was to answer the following questions about obstetrics/ gynecology (OB/GYN) residents in their second month of training: what activities do residents report performing, how often are they observed and who observes them, how often do they receive feedback and what is their perception of its usefulness, and does the time of shift affect the frequency of observation and feedback?

**METHODS:**

Nine of 10 first-year OB/GYN residents at George Washington University Hospital participated in a month-long study during their second month of training. Based on point-of-care experiences, participants prospectively recorded the time of shift, activities performed, the person who observed them, whether they received feedback, and whether it was perceived as helpful.

**RESULTS:**

First-year OB/GYN residents (postgraduate year 1 [PGY-1]) perform a variety of activities early in training while being observed by senior residents, nurses, and attending physicians 70% of the time. Residents commented that feedback was helpful almost every time they received it, regardless of who provided the feedback. There were no significant differences in the quantity of observations and feedback received between day and night shifts; however, nurses and senior residents were most likely to observe residents during night shifts.

**CONCLUSIONS:**

In this naturalistic pilot study, OB/GYN residents reported performing various procedures in their second month of training, with some observations from faculty, senior residents, and nurses. Feedback, as defined in the study, is an important aspect of their early training, although it is not reported with each patient encounter. This pilot study raises critical issues that need further study, such as the following: What should be the gold standard for observing residents around a particular activity? Where should the bar be set for types and numbers of procedures that residents perform early on in training, either with patients or in simulations? What is an acceptable feedback rate around patient encounters? Should we not consider training nurses and senior residents to deliver effective feedback to residents as part of a 360-degree process, because many trainees were observed most frequently by these members of the medical team?

## **A Cross-Sectional Study of Medical Student Knowledge of Evidence-Based Medicine as Measured by the Fresno Test of Evidence-Based Medicine**

Smith AB, Semler L, Rehman EA, Haddad ZG, Ahmadzadeh KL, Crellin SJ, Falkowska K, Kendig KA, Steinweg BH, Dusza SW, Glenn-Porter B, Kane BG. *J Emerg Med.* 2016 May;50(5):759-64. doi: 10.1016/j.jemermed.2016.02.006. Epub 2016 Mar 5.

### **BACKGROUND:**

Evidence-based medicine (EBM) has been included in the Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Emergency Medicine (ABEM) milestones project as a required component during emergency medicine (EM) residency training. Milestone Level One states that graduating medical students must be able to "describe basic principles of EBM."

### **OBJECTIVE:**

We sought to identify the EBM skills of third- and fourth-year medical students.

### **METHODS:**

Our institution, a network with 17 different residencies, hosts US osteopathic and allopathic medical students. As a part of orientation, students are required to complete an entry Fresno Test of EBM (FTEBM). Retrospectively, medical student FTEBM scores from 2011 were assessed using descriptive statistics.

### **RESULTS:**

Four hundred seventeen FTEBM scores were analyzed. Participants represented 40 medical schools, including 17 allopathic (MD) and 23 osteopathic (DO) schools. Fifty percent of participants (n = 210) were female, and 51.6% (n = 215) were from a DO medical school.

Overall mean performance for the FTEBM was 47.2%. Exploring the results by individual question were (individual EBM question topics are in parentheses): 1A (study question), 62.0%; 1B (study question), 64.4%; 2 (sources of evidence), 67.6%; 3 (study design), 57.1%; 4 (search strategies), 53.2%; 5 (relevance), 41.2%; 6 (internal validity), 43.6%; 7 (magnitude), 37.8%; 8 (two-by-two grids), 30.0%; 9 (number needed to treat), 16.9%; 10 (confidence intervals), 34.3%; 11 (diagnosis), 5.0%; and 12 (prognosis), 43.4%.

### **CONCLUSIONS:**

As measured by the FTEBM, senior medical students demonstrate understanding of about half of EBM. EM residencies can anticipate the need to instruct their residents in EBM concepts in order to meet ACGME/ABEM milestone requirements.

**Reporting Achievement of Medical Student Milestones to Residency Program Directors: An Educational Handover**

Sozener CB, Lypson ML, House JB, Hopson LR, Dooley-Hash SL, Hauff S, Eddy M, Fischer JP, Santen SA. Acad Med. 2016 May;91(5):676-84. doi: 10.1097/ACM.0000000000000953.

**PROBLEM:**

Competency-based education, including assessment of specialty-specific milestones, has become the dominant medical education paradigm; however, how to determine baseline competency of entering interns is unclear-as is to whom this responsibility falls. Medical schools should take responsibility for providing residency programs with accurate, competency-based assessments of their graduates.

**APPROACH:**

A University of Michigan ad hoc committee developed (spring 2013) a post-Match, milestone- based medical student performance evaluation for seven students matched into emergency medicine (EM) residencies. The committee determined EM milestone levels for each student based on assessments from the EM clerkship, end-of-third-year multistation standardized patient exam, EM boot camp elective, and other medical school data.

**OUTCOMES:**

In this feasibility study, the committee assessed nearly all 23 EM milestones for all seven graduates, shared these performance evaluations with the program director (PD) where each student matched, and subsequently surveyed the PDs regarding this pilot. Of the five responding PDs, none reported using the traditional medical student performance evaluation to customize training, four (80%) indicated that the proposed assessment provided novel information, and 100% answered that the assessment would be useful for all incoming trainees.

**NEXT STEPS:**

An EM milestone-based, post-Match assessment that uses existing assessment data is feasible and may be effective for communicating competency-based information about medical school graduates to receiving residency programs. Next steps include further aligning assessments with competencies, determining the benefit of such an assessment for other specialties, and articulating the national need for an effective educational handover tool between undergraduate and graduate medical education institutions.

**Rating the Quality of Entrustable Professional Activities: Content Validation and Associations with the Clinical Context**

Post JA, Wittich CM, Thomas KG, Dupras DM, Halvorsen AJ, Mandrekar JN, Oxentenko AS, Beckman TJ. *J Gen Intern Med.* 2016 May;31(5):518-23. doi: 10.1007/s11606-016-3611-8. Epub 2016 Feb 22.

**BACKGROUND:**

Entrustable professional activities (EPAs) have been developed to assess resident physicians with respect to Accreditation Council for Graduate Medical Education (ACGME) competencies and milestones. Although the feasibility of using EPAs has been reported, we are unaware of previous validation studies on EPAs and potential associations between EPA quality scores and characteristics of educational programs.

**OBJECTIVES:**

Our aim was to validate an instrument for assessing the quality of EPAs for assessment of internal medicine residents, and to examine associations between EPA quality scores and features of rotations.

**DESIGN:**

This was a prospective content validation study to design an instrument to measure the quality of EPAs that were written for assessing internal medicine residents.

**PARTICIPANTS:**

Residency leadership at Mayo Clinic, Rochester participated in this study. This included the Program Director, Associate program directors and individual rotation directors.

**INTERVENTIONS:**

The authors reviewed salient literature. Items were developed to reflect domains of EPAs useful for assessment. The instrument underwent further testing and refinement. Each participating rotation director created EPAs that they felt would be meaningful to assess learner performance in their area. These 229 EPAs were then assessed with the QUEPA instrument to rate the quality of each EPA.

**MAIN MEASURES:**

Performance characteristics of the QUEPA are reported. Quality ratings of EPAs were compared to the primary ACGME competency, inpatient versus outpatient setting and specialty type.

**KEY RESULTS:**

QUEPA tool scores demonstrated excellent reliability (ICC range 0.72 to 0.94). Higher ratings were given to inpatient versus outpatient (3.88, 3.66;  $p = 0.03$ ) focused EPAs. Medical knowledge EPAs scored significantly lower than EPAs assessing other competencies (3.34, 4.00;  $p < 0.0001$ ).

**CONCLUSIONS:**

The QUEPA tool is supported by good validity evidence and may help in rating the quality of EPAs developed by individual programs. Programs should take care when writing EPAs for the outpatient setting or to assess medical knowledge, as these tended to be rated lower.

## **Ensuring Resident Competence: A Narrative Review of the Literature on Group Decision Making to Inform the Work of Clinical Competency Committees**

Hauer KE, Cate OT, Boscardin CK, Iobst W, Holmboe ES, Chesluk B, Baron RB, O'Sullivan PS. J Grad Med Educ. 2016 May;8(2):156-64. doi: 10.4300/JGME-D-15-00144.1.

### **INTRODUCTION:**

The expectation for graduate medical education programs to ensure that trainees are progressing toward competence for unsupervised practice prompted requirements for a committee to make decisions regarding residents' progress, termed a clinical competency committee (CCC). The literature on the composition of these committees and how they share information and render decisions can inform the work of CCCs by highlighting vulnerabilities and best practices.

### **OBJECTIVE:**

We conducted a narrative review of the literature on group decision making that can help characterize the work of CCCs, including how they are populated and how they use information.

### **METHODS:**

English language studies of group decision making in medical education, psychology, and organizational behavior were used.

### **RESULTS:**

The results highlighted 2 major themes. Group member composition showcased the value placed on the complementarity of members' experience and lessons they had learned about performance review through their teaching and committee work. Group processes revealed strengths and limitations in groups' understanding of their work, leader role, and information-sharing procedures. Time pressure was a threat to the quality of group work.

### **CONCLUSIONS:**

Implications of the findings include the risks for committees that arise with homogeneous membership, limitations to available resident performance information, and processes that arise through experience rather than deriving from a well-articulated purpose of their work. Recommendations are presented to maximize the effectiveness of CCC processes, including their membership and access to, and interpretation of, information to yield evidence-based, well-reasoned judgments.

**Reflections in a Time of Transition: Orthopaedic Faculty and Resident Understanding of Accreditation Schemes and Opinions on Surgical Skills Feedback**

Gundle KR, Mickelson DT, Hanel DP. Med Educ Online. 2016 Apr 12;21:30584. doi: 10.3402/meo.v21.30584. eCollection 2016.

**INTRODUCTION:**

Orthopaedic surgery is one of the first seven specialties that began collecting Milestone data as part of the Accreditation Council for Graduate Medical Education's Next Accreditation System (NAS) rollout. This transition from process-based advancement to outcome-based education is an opportunity to assess resident and faculty understanding of changing paradigms, and opinions about technical skill evaluation.

**METHODS:**

In a large academic orthopaedic surgery residency program, residents and faculty were anonymously surveyed. A total of 31/32 (97%) residents and 29/53 (55%) faculty responded to Likert scale assessments and provided open-ended responses. An internal end-of-rotation audit was conducted to assess timeliness of evaluations. A mixed-method analysis was utilized, with nonparametric statistical testing and a constant-comparative qualitative method.

**RESULTS:**

There was greater familiarity with the six core competencies than with Milestones or the NAS ( $p < 0.05$ ). A majority of faculty and residents felt that end-of-rotation evaluations were not adequate for surgical skills feedback. Fifty-eight per cent of residents reported that end-of-rotation evaluations were rarely or never filled out in a timely fashion. An internal audit demonstrated that more than 30% of evaluations were completed over a month after rotation end. Qualitative analysis included themes of resident desire for more face-to-face feedback on technical skills after operative cases, and several barriers to more frequent feedback.

**DISCUSSION:**

The NAS and outcome-based education have arrived. Residents and faculty need to be educated on this changing paradigm. This transition period is also a window of opportunity to address methods of evaluation and feedback. In our orthopaedic residency, trainees were significantly less satisfied than faculty with the amount of technical and surgical skills feedback being provided to trainees. The quantitative and qualitative analyses converge on one theme: a desire for frequent, explicit, timely feedback after operative cases. To overcome the time-limited clinical environment, feedback tools need to be easily integrated and efficient. Creative solutions may be needed to truly achieve outcome-based graduate medical education.



**The Problem Resident Behavior Guide: Strategies for Remediation**

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

**ABSTRACT:**

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

### **Entrustable Professional Activities: Ten Things Radiologists Do**

Deitte LA, Gordon LL, Zimmerman RD, Stern EJ, McCloud TC, Diaz-Marchan PJ, Mullins ME. Acad Radiol. 2016 Mar;23(3):374-81. doi: 10.1016/j.acra.2015.11.010. Epub 2016 Jan 15.

#### **RATIONALE AND OBJECTIVES:**

Learner assessment in medical education has undergone tremendous change over the past two decades. During this time frame, the concept of Entrustable Professional Activities (EPAs) was introduced to guide the faculty when making competency-based decisions on the level of supervision required by trainees. EPAs are gaining momentum in medical education as a basis for decisions related to transitioning from residency training to clinical practice. The purpose of this article is twofold: (1) define EPAs for radiology (EPA-R) and (2) illustrate radiology-specific examples of these EPAs.

#### **MATERIALS AND METHODS:**

A multi-institutional work group composed of members of the Alliance of Directors and Vice Chairs of Education in Radiology convened at the 2015 Association of University Radiologists annual meeting to discuss radiology EPAs. The EPAs initially developed by the Accreditation Council for Graduate Medical Education (ACGME) Radiology milestone work group and the resultant ACGME Radiology milestones formed the basis for this discussion.

#### **RESULTS:**

A total of 10 radiology EPAs and illustrative vignettes were developed to help radiology educators and trainees better understand milestone assessment and how this translates to the necessary skills and responsibilities of practicing radiologists. Examples of EPA mapping to the ACGME subcompetencies and methods of assessment were included.

#### **CONCLUSIONS:**

EPAs offer an opportunity to improve our approach to training by increasing our focus on how we provide appropriate supervision to our residents and assess their progress. In this work, through suggested lists and vignettes, we have attempted to establish the framework for further discussion and development of EPA-Rs.

**Survey of the Child Neurology Program Coordinator Association: Workforce Issues and Readiness for the Next Accreditation System**

Feist TB, Campbell JL, LaBare JA, Gilbert DL. *J Child Neurol*. 2016 Mar;31(3):333-7. doi: 10.1177/ 0883073815592226. Epub 2015 Jun 26.

**ABSTRACT:**

In preparation for the implementation of the Next Accreditation System in Child Neurology, the authors organized the first meeting of child neurology program coordinators in October 2014. A workforce and program-readiness survey was conducted initially. Coordinator job titles varied widely. Most respondents (65%) managed 1 or more fellowships plus child neurology residency. Most had worked in graduate medical education less than 5 years (53%), with no career path (88%), supervised by someone without graduate medical education experience (85%), in divisions where faculty knowledge was judged inadequate (72%). A small proportion of programs had established clinical competency committee policies (28%) and was ready to implement milestone-based evaluations (56%). A post-conference survey demonstrated substantial improvements in relevant skills. The complexity of residency program management in the Next Accreditation System era supports substantive modifications to the program coordinator role. Such changes should include defined career pathway, managerial classification, administrative support, and continuing education.

## **A Suggested Emergency Medicine Boot Camp Curriculum for Medical Students Based on the Mapping of Core Entrustable Professional Activities to Emergency Medicine Level 1 Milestones**

Lamba S, Wilson B, Natal B, Nagurka R, Anana M, Sule H. *Adv Med Educ Pract.* 2016 Mar 1;7:115-24. doi: 10.2147/AMEP.S97106. eCollection 2016.

### **BACKGROUND:**

An increasing number of students rank Emergency Medicine (EM) as a top specialty choice, requiring medical schools to provide adequate exposure to EM. The Core Entrustable Professional Activities (EPAs) for Entering Residency by the Association of American Medical Colleges combined with the Milestone Project for EM residency training has attempted to standardize the undergraduate and graduate medical education goals. However, it remains unclear as to how the EPAs correlate to the milestones, and who owns the process of ensuring that an entering EM resident has competency at a certain minimum level. Recent trends establishing specialty-specific boot camps prepare students for residency and address the variability of skills of students coming from different medical schools.

### **OBJECTIVE:**

Our project's goal was therefore to perform a needs assessment to inform the design of an EM boot camp curriculum. Toward this goal, we 1) mapped the core EPAs for graduating medical students to the EM residency Level 1 milestones in order to identify the possible gaps/needs and 2) conducted a pilot procedure workshop that was designed to address some of the identified gaps/needs in procedural skills.

### **METHODS:**

In order to inform the curriculum of an EM boot camp, we used a systematic approach to 1) identify gaps between the EPAs and EM milestones (Level 1) and 2) determine what essential and supplemental competencies/skills an incoming EM resident should ideally possess. We then piloted a 1-day, three-station advanced ABCs procedure workshop based on the identified needs. A pre-workshop test and survey assessed knowledge, preparedness, confidence, and perceived competence. A post-workshop survey evaluated the program, and a posttest combined with psychomotor skills test using three simulation cases assessed students' skills.

### **RESULTS:**

Students (n=9) reported increased confidence in the following procedures: intubation (1.5-2.1), thoracostomy (1.1-1.9), and central venous catheterization (1.3-2) (a three-point Likert-type scale, with 1= not yet confident/able to perform with supervision to 3= confident/able to perform without supervision). Psychomotor skills testing showed on average, 26% of students required verbal prompting with performance errors, 48% with minor performance errors, and 26% worked independently without performance errors. All participants reported: 1) increased knowledge and confidence in covered topics and 2) overall satisfaction with simulation experience.

### **CONCLUSION:**

Mapping the Core EPAs for Entering Residency to the EM milestones at Level 1 identifies educational gaps for graduating medical students seeking a career in EM. Educators designing EM boot camps for medical students should consider these identified gaps, procedures, and clinical conditions during the development of a core standardized curriculum.

**Driving Care Quality: Aligning Trainee Assessment and Supervision through Practical Application of Entrustable Professional Activities, Competencies, and Milestones**

Carraccio C, Englander R, Holmboe ES, Kogan JR. Acad Med. 2016 Feb;91(2):199-203. doi: 10.1097/ACM.0000000000000985.

**ABSTRACT:**

To address the long-standing challenge of meaningful trainee assessment, the authors reviewed and expanded on the Accountable Assessment for Quality Care and Supervision (AAQCS) equation. The equation proposes that care quality is the product of the interaction between trainee performance (measured by workplace assessment) and supervision (required level of intervention to ensure care quality) in the context of the environment where the care occurs: Trainee performance × Appropriate supervision = Safe, effective patient-centered care. Assessing trainee performance and matching that performance to "appropriate" supervision, however, is fraught with challenges. The authors suggest a unifying framework that integrates entrustable professional activities (EPAs), competencies, and milestones to inform trainee assessment and supervision, thereby enabling the practical application of the AAQCS equation in the workplace. Because the unit of measure for an EPA is the outcome of whether the trainee can safely and effectively perform the professional activity without supervision, the proposed unifying framework directly aligns with the dependent variable in the AAQCS equation: care quality. The value of applying a unifying framework that integrates EPAs, competencies, and milestones to the AAQCS equation in the clinical learning environment lies in its ability to provide supervisors with a shared mental model of performance expectations for trainees, reducing unwanted variability and improving assessment accuracy; guidance for aligning performance milestones of trainees with the needed level of supervisor intervention to ensure care quality; and substrate for specific feedback to improve the trainee's professional development as a way to ensure future care quality.

**Comprehensive Observations of Resident Evolution: A Novel Method for Assessing Procedure- Based Residency Training**

Cooney CM, Cooney DS, Bello RJ, Bojovic B, Redett RJ, Lifchez SD. *Plast Reconstr Surg*. 2016 Feb;137(2): 673-8. doi: 10.1097/01.prs.0000475797.69478.0e.

**BACKGROUND:**

Assessment of surgical skills in the operating room remains a challenge. Increasing documentation requirements of the Accreditation Council for Graduate Medical Education are necessitating mechanisms to document trainee competence without hindering operative turnover. The authors created a comprehensive electronic resource to facilitate plastic surgery training program compliance with changes mandated by Next Accreditation System Milestones and the ACGME.

**METHODS:**

In 2013, the authors implemented the Comprehensive Observations of Resident Evolution, or CORE, a Web-based tool to assess plastic surgery residents. It comprises a rapid electronic assessment of resident operating room performance completed after each surgery; a data dashboard displaying graphical summaries of resident progress by case, Milestone, or current procedural terminology code; and an electronic Milestones tracker (MileMarker), which enables ongoing trainee assessments.

**RESULTS:**

From January through October of 2014, 24 residents completed nearly 1300 Operative Entrustability Assessments. Thirty-eight percent of residents reported more immediate feedback regarding operative performance. The assessment demonstrates construct validity, which distinguishes novice residents from experienced residents. Individual case data identify resident-specific operative strengths and weaknesses. Using assessment data, the first two Clinical Competency Committee reviews were 81 percent and 87 percent shorter than Milestones pilot test site reports (average, 11.5 and 8 minutes versus 60 minutes per resident, respectively).

**CONCLUSIONS:**

Comprehensive Observations of Resident Evolution is capable of capturing operative performance data on all operating room cases by primary current procedural terminology code. It increases immediate attending/ trainee feedback and assessment transparency, enables trainee self-monitoring, and informs end-of-rotation reviews, program-wide assessments, and tailoring of training to address specific needs. It is a valuable resource for tracking resident progress in real-time while maintaining compliance with evolving ACGME requirements.

**Assessment of Competence: The Accreditation Council for Graduate Medical Education/Residency Review Committee Perspective**

Potts JR 3rd. Surg Clin North Am. 2016 Feb;96(1):15-24. doi: 10.1016/j.suc.2015.08.008.

**ABSTRACT:**

Competency is an individual trait. As an agency that accredits programs and institutions, the Accreditation Council for Graduate Medical Education (ACGME) does not define or assess competency. However, in the past 15 years the ACGME has promulgated several initiatives to aid programs in the assessment of the competence of their residents and fellows. Those initiatives include the Outcomes Project (which codified the competencies), the Milestones, and the Clinical Learning Environment Review Program. In the near future, the ACGME will implement an initiative by which programs can develop and study the results of competency- based residency curricula.

**Academic Affairs and Global Health: How Global Health Electives Can Accelerate Progress towards ACGME Milestones**

Hayward AS, Jacquet GA, Sanson T, Mowafi H, Hansoti B. *Int J Emerg Med*. 2015 Dec;8(1):45. doi: 10.1186/s12245-015-0093-0. Epub 2015 Dec 2.

**ABSTRACT:**

Global health electives (GHEs) have become a standard offering in many residency programs. Residency electives should aid residents in achieving outcomes in the Accreditation Council for Graduate Medical Education (ACGME) competency domains. In this paper, the authors review existing literature and provide expert opinion to highlight how global health electives can complement traditional training programs to assist residents in achieving ACGME milestones, using emergency medicine residency as an example. Recommendations are provided for identifying exemplary global health electives and for the development of institutional global health elective curricula in order to facilitate milestone achievement. Global health electives can advance progress towards ACGME milestones; however, they may vary greatly in terms of potential for learner advancement. Electives should thus be rigorously vetted to ensure they meet standards that will facilitate this process. Given that milestones are a newly introduced tool for assessing resident educational achievement, very little research is available currently to directly determine impacts, and further study will be needed.



**Using Transitional Year Milestones to Assess Graduating Medical Students' Skills during a Capstone Course**

Clay AS, Andolsek K, Grochowski CO, Engle DL, Chudgar SM. J Grad Med Educ. 2015 Dec;7(4):658-62. doi: 10.4300/JGME-D-14-00569.1.

**BACKGROUND:**

Undergraduate medical education (UME) follows the lead of graduate medical education (GME) in moving to competency-based assessment. The means for and the timing of competency-based assessments in UME are unclear.

**OBJECTIVE:**

We explored the feasibility of using the Accreditation Council for Graduate Medical Education Transitional Year (TY) Milestones to assess student performance during a mandatory, fourth-year capstone course.

**METHODS:**

Our single institution, observational study involved 99 medical students who completed the course in the spring of 2014. Students' skills were assessed by self, peer, and faculty assessment for 6 existing course activities using the TY Milestones. Evaluation completion rates and mean scores were calculated.

**RESULTS:**

Students' mean milestone levels ranged between 2.2 and 3.6 (on a 5-level scoring rubric). Level 3 is the performance expected at the completion of a TY. Students performed highest in breaking bad news and developing a quality improvement project, and lowest in developing a learning plan, working in interdisciplinary teams, and stabilizing acutely ill patients. Evaluation completion rates were low for some evaluations, and precluded use of the data for assessing student performance in the capstone course. Students were less likely to complete separate online evaluations. Faculty were less likely to complete evaluations when activities did not include dedicated time for evaluations.

**CONCLUSIONS:**

Assessment of student competence on 9 TY Milestones during a capstone course was useful, but achieving acceptable evaluation completion rates was challenging. Modifications are necessary if milestone scores from a capstone are intended to be used as a handoff between UME and GME.

## **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.

**Use of a Formal Assessment Instrument for Evaluation of Resident Operative Skills in Pediatric Neurosurgery**

Hadley C, Lam SK, Briceño V, Luerssen TG, Jea A. *J Neurosurg Pediatr.* 2015 Nov;16(5):497- 504. doi: 10.3171/2015.1.PEDS14511. Epub 2015 Aug 28.

**OBJECTIVE:**

Currently there is no standardized tool for assessment of neurosurgical resident performance in the operating room. In light of enhanced requirements issued by the Accreditation Council for Graduate Medical Education's Milestone Project and the Matrix Curriculum Project from the Society of Neurological Surgeons, the implementation of such a tool seems essential for objective evaluation of resident competence. Beyond compliance with governing body guidelines, objective assessment tools may be useful to direct early intervention for trainees performing below the level of their peers so that they may be given more hands-on teaching, while strong residents can be encouraged by faculty members to progress to conducting operations more independently with passive supervision. The aims of this study were to implement a validated assessment tool for evaluation of operative skills in pediatric neurosurgery and determine its feasibility and reliability.

**METHODS:**

All neurosurgery residents completing their pediatric rotation over a 6-month period from January 1, 2014, to June 30, 2014, at the authors' institution were enrolled in this study. For each procedure, residents were evaluated by means of a form, with one copy being completed by the resident and a separate copy being completed by the attending surgeon. The evaluation form was based on the validated Objective Structured Assessment of Technical Skills for Surgery (OSATS) and used a 5-point Likert-type scale with 7 categories: respect for tissue; time and motion; instrument handling; knowledge of instruments; flow of operation; use of assistants; and knowledge of specific procedure. Data were then stratified by faculty versus resident (self-) assessment; postgraduate year level; and difficulty of procedure. Descriptive statistics (means and SDs) were calculated, and the results were compared using the Wilcoxon signed-rank test and Student t- test. A p value < 0.05 was considered statistically significant. **RESULTS** Six faculty members, 1 fellow, and 8 residents completed evaluations for 299 procedures, including 32 ventriculoperitoneal (VP) shunt revisions, 23 VP shunt placements, 19 endoscopic third ventriculostomies, and 18 craniotomies for tumor resection. There was no significant difference between faculty and resident self-assessment scores overall or in any of the 7 domains scores for each of the involved residents. On self-assessment, senior residents scored themselves significantly higher ( $p < 0.02$ ) than junior residents overall and in all domains except for "time and motion." Faculty members scored senior residents significantly higher than junior residents only for the "knowledge of instruments" domain ( $p = 0.05$ ). When procedure difficulty was considered, senior residents' scores from faculty members were significantly higher ( $p = 0.04$ ) than the scores given to junior residents for expert procedures only. Senior residents' self- evaluation scores were significantly higher than those of junior residents for both expert ( $p = 0.03$ ) and novice ( $p = 0.006$ ) procedures.

**CONCLUSIONS:**

OSATS is a feasible and reliable assessment tool for the comprehensive evaluation of neurosurgery resident performance in the operating room. The authors plan to use this tool to assess resident operative skill development and to improve direct resident feedback.

**Establishing a Surgical Skills Laboratory and Dissection Curriculum for Neurosurgical Residency Training**

Liu JK, Kshetry VR, Recinos PF, Kamian K, Schlenk RP, Benzel EC. *J Neurosurg.* 2015 Nov;123(5):1331-8. doi: 10.3171/2014.11.JNS14902. Epub 2015 May 26.

**ABSTRACT:**

Surgical education has been forced to evolve from the principles of its initial inception, in part due to external pressures brought about through changes in modern health care. Despite these pressures that can limit the surgical training experience, training programs are being held to higher standards of education to demonstrate and document trainee competency through core competencies and milestones. One of the methods used to augment the surgical training experience and to demonstrate trainee proficiency in technical skills is through a surgical skills laboratory. The authors have established a surgical skills laboratory by acquiring equipment and funding from nondepartmental resources, through institutional and private educational grants, along with product donations from industry. A separate educational curriculum for junior- and senior-level residents was devised and incorporated into the neurosurgical residency curriculum. The initial dissection curriculum focused on cranial approaches, with spine and peripheral nerve approaches added in subsequent years. The dissections were scheduled to maximize the use of cadaveric specimens, experimenting with techniques to best preserve the tissue for repeated uses. A survey of residents who participated in at least 1 year of the curriculum indicated that participation in the surgical skills laboratory translated into improved understanding of anatomical relationships and the development of technical skills that can be applied in the operating room. In addition to supplementing the technical training of surgical residents, a surgical skills laboratory with a dissection curriculum may be able to help provide uniformity of education across different neurosurgical training programs, as well as provide a tool to assess the progression of skills in surgical trainees.

**How Do Emergency Medicine Residency Programs Structure their Clinical Competency Committees? A Survey**

Doty CI, Roppolo LP, Asher S, Seamon JP, Bhat R, Taft S, Graham A, Willis J. Acad Emerg Med. 2015 Nov;22(11):1351-4. doi: 10.1111/acem.12804. Epub 2015 Oct 16.

**BACKGROUND:**

The Accreditation Council for Graduate Medical Education (ACGME) recently has mandated the formation of a clinical competency committee (CCC) to evaluate residents across the newly defined milestone continuum. The ACGME has been nonproscriptive of how these CCCs are to be structured in order to provide flexibility to the programs.

**OBJECTIVES:**

No best practices for the formation of CCCs currently exist. We seek to determine common structures of CCCs recently formed in the Council of Emergency Medicine Residency Directors (CORD) member programs and identify unique structures that have been developed.

**METHODS:**

In this descriptive study, an 18-question survey was distributed via the CORD listserv in the late fall of 2013. Each member program was asked questions about the structure of its CCC. These responses were analyzed with simple descriptive statistics.

**RESULTS:**

A total of 116 of the 160 programs responded, giving a 73% response rate. Of responders, most (71.6%) CCCs are chaired by the associate or assistant program director, while a small number (14.7%) are chaired by a core faculty member. Program directors (PDs) chair 12.1% of CCCs. Most CCCs are attended by the PD (85.3%) and selected core faculty members (78.5%), leaving the remaining committees attended by any core faculty. Voting members of the CCC consist of the residency leadership either with the PD (53.9%) or without the PD (36.5%) as a voting member. CCCs have an average attendance of 7.4 members with a range of three to 15 members. Of respondents, 53.1% of CCCs meet quarterly while 37% meet monthly. The majority of programs (76.4%) report a system to match residents with a faculty mentor or advisor. Of respondents, 36% include the resident's faculty mentor or advisor to discuss a particular resident. Milestone summaries (determination of level for each milestone) are the primary focus of discussion (93.8%), utilizing multiple sources of information.

**CONCLUSIONS:**

The substantial variability and diversity found in our CORD survey of CCC structure and function suggest that there are myriad strategies that residency programs can use to match individual program needs and resources to requirements of the ACGME. Identifying a single protocol for CCC structure and development may prove challenging.

**Assessing EM Patient Safety and Quality Improvement Milestones Using a Novel Debate Format**

Mamtani M, Scott KR, DeRoos FJ, Conlon LW. West J Emerg Med. 2015 Nov;16(6):943-6. doi: 10.5811/westjem.2015.9.27269. Epub 2015 Nov 12.

**ABSTRACT:**

Graduate medical education is increasingly focused on patient safety and quality improvement; training programs must adapt their curriculum to address these changes. We propose a novel curriculum for emergency medicine (EM) residency training programs specifically addressing patient safety, systems-based management, and practice-based performance improvement, called "EM Debates." Following implementation of this educational curriculum, we performed a cross-sectional study to evaluate the curriculum through resident self-assessment. Additionally, a cross-sectional study to determine the ED clinical competency committee's (CCC) ability to assess residents on specific competencies was performed. Residents were overall very positive towards the implementation of the debates. Of those participating in a debate, 71% felt that it improved their individual performance within a specific topic, and 100% of those that led a debate felt that they could propose an evidence-based approach to a specific topic. The CCC found that it was easier to assess milestones in patient safety, systems-based management, and practice-based performance improvement (sub-competencies 16, 17, and 19) compared to prior to the implementation of the debates. The debates have been a helpful venue to teach EM residents about patient safety concepts, identifying medical errors, and process improvement.

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

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

**CONTEXT:**

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

**OBJECTIVES:**

Despite the advantages of CBME, numerous concerns and challenges to the implementation of CBME frameworks have been described, including: increased administrative requirements; the need for faculty development; the lack of models for flexible curricula, and inconsistencies in terms and definitions.

Additionally, there are concerns about reductionist approaches to assessment in CBME, lack of good assessments for some competencies, and whether CBME frameworks include domains of current importance. This study will outline these issues and discuss the responses of the medical education community.

**METHODS:**

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

**CONCLUSIONS:**

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

**Pathology Milestones: Assessing Clinical Competency by Committee**

Klutts JS, Guerin LA, Bruch LA, Firchau DJ, Knudson CM, Rosenthal NS, Samuelson MI, Jensen CS, Delwiche JL, Krasowski MD. Acad Pathol. 2015 Oct 29;2(4):2374289515614003. doi: 10.1177/2374289515614003. eCollection 2015 Oct-Dec.

**ABSTRACT:**

All Accreditation Council for Graduate Medical Education accredited pathology residency training programs are now required to evaluate residents using the new Pathology Milestones assessment tool. Similar to implementation of the 6 Accreditation Council for Graduate Medical Education competencies a decade ago, there have been challenges in implementation of the new milestones for many residency programs. The pathology department at the University of Iowa has implemented a process that divides the labor of the task in rating residents while also maintaining consistency in the process. The process is described in detail, and some initial trends in milestone evaluation are described and discussed. Our experience indicates that thoughtful implementation of the Pathology Milestones can provide programs with valuable information that can inform curricular changes.



**Reflections on the First 2 Years of Milestone Implementation**

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

*-No Abstract Available.*

**A Retrospective Review of Required Projects in Systems-Based Practice in a Single Anesthesiology Residency: A 10-Year Experience**

Sakai T, Emerick TD, Patel RM. J Clin Anesth. 2015 Sep;27(6):451-6. doi: 10.1016/j.jclinane. 2015.06.009. Epub 2015 Aug 3.

**STUDY OBJECTIVE:**

The Accreditation Council for Graduate Medical Education has emphasized in its core competencies and more recently, in its Milestones Project, that residents understand the importance of systems-based practice (SBP). The objectives of the study are to evaluate the quality of residents' SBP projects and to determine the degrees that were subsequently implemented.

**DESIGN:**

A retrospective educational observational study.

**SETTING:**

A university-based anesthesiology training institution.

**SUBJECTS:**

One hundred forty-nine anesthesiology residents in their final (postgraduate year 4) year of training who completed SBP projects for the last 10 years (2004-2013).

**INTERVENTIONS:**

A structured SBP course was provided for postgraduate year 4 anesthesiology residents with deadlines set such as project identification, data collection, and proposal draft. Each resident's written SBP proposal received inputs by 2 members of the department executive steering committee. The SBP projects concluded with oral presentations by each resident to the department executive steering committee, who provided overall scores.

**MEASUREMENTS:**

All SBP projects were categorized into 7 categories: safety initiatives, economic analysis, process analysis, policy change recommendations, education initiatives, teamwork/communication, and operating room efficiency. Evaluation scores using a Likert scale (1-9, where 9 is the best) were analyzed. The rate of implementation of project ideas within the department based on the presentations to the executive committee was examined.

**MAIN RESULTS:**

Of 149 projects, policy change recommendations was the most frequently chosen category (46 projects; 30.9%), followed by process analysis (36 projects; 24.2%). The overall evaluation score was  $7.6 \pm 0.6$  (mean  $\pm$  SD). A total of 53 projects (35.6%) were implemented in the department. There was no statistical difference between SBPs with implementation vs SBPs without implementation in terms of evaluation scores, year of the presentation, or categories.

**CONCLUSIONS:**

This SBP project has given residents the opportunity to participate in a hospital system change aiming to improve efficiency and safety.

## **Navigating the Next Accreditation System: A Dashboard for the Milestones**

Johna S, Woodward B. Perm J. 2015 Fall;19(4):61-3. doi: 10.7812/TPP/15-041.

### **INTRODUCTION:**

In July 2014, all residency programs accredited by the Accreditation Council for Graduate Medical Education (ACGME) were enrolled in a new system called the Next Accreditation System. Residency programs may not be clear on how best to comply with these new accreditation requirements. Large amounts of data must be collected, evaluated, and submitted twice a year to the council's Web-based data collection system. One challenge is that the new "end-of-rotation" evaluations must reflect specialty-specific milestones, on which many faculty members are not well versed. Like other residency programs, we tried to address the challenges using our local resources.

### **METHODS:**

We used our existing electronic goals and objectives for each rotation coupled with appropriate end-of-rotation evaluations reflecting the specialty-specific milestones through a process of editing and mapping.

### **RESULTS:**

Data extracted from these evaluations were added to an interactive dashboard that also contained evaluations on additional program-specific modifiers of residents' performance. A resident's final overall performance was visually represented on a plot graph. The novel dashboard included features to save evaluations for future comparisons and to track residents' progress during their entire training. It proved simple to use and was able to reduce the time needed for each resident evaluation to 5 to 10 minutes.

### **CONCLUSION:**

This tool has made it much easier and less challenging for the members of our Clinical Competency Committee to start deliberation about each resident's performance.

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

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

### **OBJECTIVES:**

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

### **METHODS:**

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

### **RESULTS:**

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

### **CONCLUSIONS:**

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

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

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

**BACKGROUND:**

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

**METHODS:**

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

**RESULTS:**

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

**CONCLUSIONS:**

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

**Initial Validity Analysis of the Emergency Medicine Milestones**

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

**OBJECTIVES:**

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

**METHODS:**

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

Exploratory factor analysis was conducted to determine how the subcompetencies were interrelated.

**RESULTS:**

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

**CONCLUSIONS:**

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

**Piloting a Structured Practice Audit to Assess ACGME Milestones in Written Handoff Communication in Internal Medicine**

Farnan JM, McConville JF, Arora VM. *J Grad Med Educ.* 2015 Jun;7(2):238-41. doi: 10.4300/JGME-D-14-00482.1.

**BACKGROUND:**

Written communication skills are integral to patient care handoffs. Residency programs require feasible assessment tools that provide timely formative and summative feedback, ideally linked to the Accreditation Council for Graduate Medical Education Milestones.

**OBJECTIVE:**

We describe the use of 1 such tool-UPDATED-to assess written handoff communication skills in internal medicine interns.

**METHODS:**

During 2012-2013, the authors piloted a structured practice audit at 1 academic institution to audit written sign-outs completed by 45 interns, using the UPDATED tool, which scores 7 aspects of sign-out communication linked to milestones. Intern sign-outs were audited by trained faculty members throughout the year. Results were incorporated into intern performance reviews and Clinical Competency Committees.

**RESULTS:**

A total of 136 sign-outs were audited (averaging 3.1 audits per intern). In the first trimester, 14 interns (31%) had satisfactory audit results. Five interns (11%) had critical deficiencies and received immediate feedback, and the remaining 26 (58%) were assigned future audits due to missing audits or unsatisfactory scores. In the second trimester, 21 interns (68%) had satisfactory results, 1 had critical deficiencies, and 9 (29%) required future audits. Nine of the 10 remaining interns in the final trimester had satisfactory audits. Faculty time was estimated at 10 to 15 minutes per sign-out audited.

**CONCLUSIONS:**

The UPDATED audit is a milestone-based tool that can be used to assess written sign-out communication skills in internal medicine residency programs. Future work is planned to adapt the tool for use by senior supervisory residents to appraise sign-outs in real time.

**Direct versus Remote Clinical Observation: Assessing Learners' Milestones while Addressing Adolescent Patients' Needs**

Pitts S, Borus J, Goncalves A, Gooding H. *J Grad Med Educ.* 2015 Jun;7(2):253-5. doi: 10.4300/JGME-D-14-00484.1.

**BACKGROUND:**

Direct clinical observation is an essential component of medical trainee assessment, particularly in the era of milestone-based competencies. However, the adolescent patient's perspective on this practice is missing from the literature. Quality health care is patient centered, yet we did not know if our educational practices align with this clinical goal.

**OBJECTIVE:**

We sought to better understand our adolescent/young adult patients' perspectives of the direct observation of our medical trainees in the outpatient clinical setting.

**METHODS:**

As a quality improvement initiative, we surveyed adolescent/young adult patients, medical trainees, and physician observers in our outpatient clinical practice regarding their experience following a direct observation encounter. We performed descriptive analyses of the data.

**RESULTS:**

During a 1-year period, responses were received from 23 adolescent/young adult patients, 8 family members, 14 trainees, and 6 faculty observers. Nearly all adolescent/young adult patients (n=22) and all surveyed family members (n=8) expressed comfort with direct observation, and all respondents felt the care they received was the same or better. All patient/family respondents preferred direct observation to the idea of remote observation, and most, but not all, trainees and faculty observers expressed similar opinions.

**CONCLUSIONS:**

Adolescent/young adult patients and their family members found direct observation of their trainee providers to be comfortable and beneficial. Despite adolescent and young adults' facility and comfort with modern technologies, there was an expressed preference for direct versus remote observation.



**Realizing the Promise of Competency-Based Medical Education**

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

**ABSTRACT:**

Competency-based medical education (CBME) places a premium on both educational and clinical outcomes. The Milestones component of the Next Accreditation System represents a fundamental change in medical education in the United States and is part of the drive to realize the full promise of CBME. The Milestones framework provides a descriptive blueprint in each specialty to guide curriculum development and assessment practices. From the beginning of the Outcomes project in 1999, the Accreditation Council for Graduate Medical Education and the larger medical education community recognized the importance of improving their approach to assessment. Work-based assessments, which rely heavily on the observations and judgments of clinical faculty, are central to a competency-based approach. The direct observation of learners and the provision of robust feedback have always been recognized as critical components of medical education, but CBME systems further elevate their importance. Without effective and frequent direct observation, coaching, and feedback, the full potential of CBME and the Milestones cannot be achieved. Furthermore, simply using the Milestones as end-of-rotation evaluations to "check the box" to meet requirements undermines the intent of an outcomes-based accreditation system. In this Commentary, the author explores these challenges, addressing the concerns raised by Williams and colleagues in their Commentary. Meeting the assessment challenges of the Milestones will require a renewed commitment from institutions to meet the profession's "special obligations" to patients and learners. All stakeholders in graduate medical education must commit to a professional system of self-regulation to prepare highly competent physicians to fulfill this social contract.

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

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

**ABSTRACT:**

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

### **Quality Improvement in Neurological Surgery Graduate Medical Education**

Parker SL, McGirt MJ, Asher AL, Selden NR. Neurosurg Clin N Am. 2015 Apr;26(2):231-8, ix. doi: 10.1016/j.nec.2014.11.012. Epub 2014 Dec 17.

#### **ABSTRACT:**

There has been no formal, standardized curriculum for neurosurgical resident education in quality improvement. There are at least 2 reasons to integrate a formalized quality improvement curriculum into resident education: (1) increased emphasis on the relative quality and value (cost-effectiveness) of health care provided by individual physicians, and (2) quality improvement principles empower broader lifelong learning. An integrated quality improvement curriculum should comprise specific goals and milestones at each level of residency training.

This article discusses the role and possible implementation of a national program for quality improvement in neurosurgical resident education.

### **The Milestones for Psychosomatic Medicine Subspecialty Training**

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

#### **BACKGROUND:**

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

#### **METHODS:**

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

#### **RESULTS:**

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

#### **CONCLUSIONS:**

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

**CORR<sup>®</sup> Curriculum—Orthopaedic Education: Operative Assessment and the ACGME Milestones: Time for Change**

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

**ABSTRACT:**

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

### **Two Cheers for Milestones**

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

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

**A Survey of Resident Perspectives on Surgical Case Minimums and the Impact on Milestones, Graduation, Credentialing, and Preparation for Practice: AOA Critical Issues**

Jeray KJ, Frick SL. *J Bone Joint Surg Am.* 2014 Dec 3;96(23):e195. doi: 10.2106/JBJS.N.00044.

**ABSTRACT:**

Residency education continues to evolve. Several major changes have occurred in the past several years, including emphasis on core competencies, duty-hour restrictions, and call. The Accreditation Council for Graduate Medical Education (ACGME) Next Accreditation System (NAS) implemented educational milestones in orthopaedic surgery in July 2013. Additionally, the Residency Review Committee for orthopaedic surgery published suggested surgical case minimums in 2012, which overlap with several of the milestones. We conducted a survey to assess the opinions of orthopaedic residents regarding the ACGME-suggested surgical case minimums and the effects that these may have on resident education and potential future privileges in hospitals. The survey was sent via e-mail to all of the residents participating in the American Orthopaedic Association (AOA) Resident Leadership Forum for both 2011 and 2012. Participants in the Resident Leadership Forum are in either postgraduate year 4 or postgraduate year 5, are selected by the program directors as resident leaders, and represent 80% of the orthopaedic residency programs in the United States. The survey was completed by 157 of the 314 participants. Sixty-nine percent of the participants believed that case logs with minimum numbers of surgical procedures were an effective way to monitor the work but were not necessarily the only way to monitor the educational progress of the residents. Thirty-two percent believed that the minimums should not be required. Overwhelmingly, there was agreement that important cases were missing from the currently proposed sixteen core surgical minimums.

Specifically, the residents believed that a minimum number of cases are necessary for distal radial fracture fixation and proximal humeral fracture fixation and possibly have a milestone to reflect the progress of the residents for each fixation. Most residents thought that surgical case minimums are an effective tool in monitoring the progress of residents and measuring the effectiveness of residency programs. However, the surgical ability of an individual resident should not be evaluated on case minimums alone. The development of the milestones to assess competency should continue, but, as surgical skill is not a specific core competency, perhaps other methods for assessing surgical proficiency need to be developed rather than case minimums. Surgical skills laboratories and proctoring residents independently performing procedures may help to assess surgical proficiency, in addition to traditional faculty and 360° evaluations. Combining these types of assessments with surgical case logs documenting the residents' educational experience seems to be the best path going forward in assessing the development of young surgeons.

### **Cytopathology Fellowship Milestones**

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

#### **ABSTRACT:**

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

The rationale, development, and details of the cytopathology fellowship milestones are described herein.



## **Assessment of Resident Operative Performance Using a Real-Time Mobile Web System: Preparing for the Milestone Age**

Wagner JP, Chen DC, Donahue TR, Quach C, Hines OJ, Hiatt JR, Tillou A. J Surg Educ. 2014 Nov- Dec;71(6):e41-6. doi: 10.1016/j.jsurg.2014.06.008. Epub 2014 Jul 16.

### **OBJECTIVE:**

To satisfy trainees' operative competency requirements while improving feedback validity and timeliness using a mobile Web-based platform.

### **DESIGN:**

The Southern Illinois University Operative Performance Rating Scale (OPRS) was embedded into a website formatted for mobile devices. From March 2013 to February 2014, faculty members were instructed to complete the OPRS form while providing verbal feedback to the operating resident at the conclusion of each procedure. Submitted data were compiled automatically within a secure Web-based spreadsheet. Conventional end-of-rotation performance (CERP) evaluations filed 2006 to 2013 and OPRS performance scores were compared by year of training using serial and independent-samples t tests. The mean CERP scores and OPRS overall resident operative performance scores were directly compared using a linear regression model. OPRS mobile site analytics were reviewed using a Web-based reporting program.

### **SETTING:**

Large university-based general surgery residency program.

### **PARTICIPANTS:**

General Surgery faculty used the mobile Web OPRS system to rate resident performance. Residents and the program director reviewed evaluations semiannually.

### **RESULTS:**

Over the study period, 18 faculty members and 37 residents logged 176 operations using the mobile OPRS system. There were 334 total OPRS website visits. Median time to complete an evaluation was 45 minutes from the end of the operation, and faculty spent an average of 134 seconds on the site to enter 1 assessment. In the 38,506 CERP evaluations reviewed, mean performance scores showed a positive linear trend of 2% change per year of training ( $p = 0.001$ ). OPRS overall resident operative performance scores showed a significant linear ( $p = 0.001$ ), quadratic ( $p = 0.001$ ), and cubic ( $p = 0.003$ ) trend of change per year of clinical training, reflecting the resident operative experience in our training program. Differences between postgraduate year-1 and postgraduate year-5 overall performance scores were greater with the OPRS (mean = 0.96, CI: 0.55-1.38) than with CERP measures (mean = 0.37, CI: 0.34-0.41).

Additionally, there were consistent increases in each of the OPRS subcategories.

### **CONCLUSIONS:**

In contrast to CERPs, the OPRS fully satisfies the Accreditation Council for Graduate Medical Education and American Board of Surgery operative assessment requirements. The mobile Web platform provides a convenient interface, broad accessibility, automatic data compilation, and compatibility with common database and statistical software. Our mobile OPRS system encourages candid feedback dialog and generates a comprehensive review of individual and group-wide operative proficiency in real time.

**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.

## **Preparing Medical Students for Obstetrics and Gynecology Milestone Level One: A Description of a Pilot Curriculum**

Morgan H, Marzano D, Lanham M, Stein T, Curran D, Hammoud M. Med Educ Online. 2014 Nov 26;19:25746. doi: 10.3402/meo.v19.25746. eCollection 2014.

### **BACKGROUND:**

The implementation of the Accreditation Council for Graduate Medical Education (ACGME) Milestones in the field of obstetrics and gynecology has arrived with Milestones Level One defined as the level expected of an incoming first-year resident.

### **PURPOSE:**

We designed, implemented, and evaluated a 4-week elective for fourth-year medical school students, which utilized a multimodal approach to teaching and assessing the Milestones Level One competencies.

### **METHODS:**

The 78-hour curriculum utilized traditional didactic lectures, flipped classroom active learning sessions, a simulated paging curriculum, simulation training, embalmed cadaver anatomical dissections, and fresh-frozen cadaver operative procedures. We performed an assessment of student knowledge and surgical skills before and after completion of the course. Students also received feedback on their assessment and management of eight simulated paging scenarios. Students completed course content satisfaction surveys at the completion of each of the 4 weeks.

### **RESULTS:**

Students demonstrated improvement in knowledge and surgical skills at the completion of the course. Paging confidence trended toward improvement at the completion of the course. Student satisfaction was high for all of the course content, and the active learning components of the curriculum (flipped classroom, simulation, and anatomy sessions) had higher scores than the traditional didactics in all six categories of our student satisfaction survey.

### **CONCLUSIONS:**

This pilot study demonstrates a practical approach for preparing fourth-year medical students for the expectations of Milestones Level One in obstetrics and gynecology. This curriculum can serve as a framework as medical schools and specific specialties work to meet the first steps of the ACGME's Next Accreditation System.

## **Impact on House Staff Evaluation Scores When Changing from a Dreyfus- to a Milestone-Based Evaluation Model: One Internal Medicine Residency Program's Findings**

Friedman KA, Balwan S, Cacace F, Katona K, Sunday S, Chaudhry S. Med Educ Online. 2014 Nov 24;19:25185. doi: 10.3402/meo.v19.25185. eCollection 2014.

### **PURPOSE:**

As graduate medical education (GME) moves into the Next Accreditation System (NAS), programs must take a critical look at their current models of evaluation and assess how well they align with reporting outcomes. Our objective was to assess the impact on house staff evaluation scores when transitioning from a Dreyfus-based model of evaluation to a Milestone-based model of evaluation. Milestones are a key component of the NAS.

### **METHOD:**

We analyzed all end of rotation evaluations of house staff completed by faculty for academic years 2010- 2011 (pre-Dreyfus model) and 2011-2012 (post-Milestone model) in one large university-based internal medicine residency training program. Main measures included change in PGY-level average score; slope, range, and separation of average scores across all six Accreditation Council for Graduate Medical Education (ACGME) competencies.

### **RESULTS:**

Transitioning from a Dreyfus-based model to a Milestone-based model resulted in a larger separation in the scores between our three post-graduate year classes, a steeper progression of scores in the PGY-1 class, a wider use of the 5-point scale on our global end of rotation evaluation form, and a downward shift in the PGY-1 scores and an upward shift in the PGY-3 scores.

### **CONCLUSIONS:**

For faculty trained in both models of assessment, the Milestone-based model had greater discriminatory ability as evidenced by the larger separation in the scores for all the classes, in particular the PGY-1 class.

**Practicing Emergency Physicians Report Performing Well on Most Emergency Medicine Milestones**

Peck TC, Dubosh N, Rosen C, Tibbles C, Pope J, Fisher J. J Emerg Med. 2014 Oct;47(4):432-40. doi: 10.1016/j.jemermed.2014.04.032. Epub 2014 Jul 8.

**BACKGROUND:**

The Accreditation Council for Graduate Medical Education's Next Accreditation System endorsed specialty-specific milestones as the foundation of an outcomes-based resident evaluation process. These milestones represent five competency levels (entry level to expert), and graduating residents will be expected to meet Level 4 on all 23 milestones. Limited validation data on these milestones exist. It is unclear if higher levels represent true competencies of practicing emergency medicine (EM) attendings.

**OBJECTIVE:**

Our aim was to examine how practicing EM attendings in academic and community settings self-evaluate on the new EM milestones.

**METHODS:**

An electronic self-evaluation survey outlining 9 of the 23 EM milestones was sent to a sample of practicing EM attendings in academic and community settings. Attendings were asked to identify which level was appropriate for them.

**RESULTS:**

Seventy-nine attendings were surveyed, with an 89% response rate. Sixty-one percent were academic. Twenty-three percent (95% confidence interval [CI] 20%-27%) of all responses were Levels 1, 2, or 3; 38% (95% CI 34%-42%) were Level 4; and 39% (95% CI 35%-43%) were Level 5. Seventy-seven percent of attendings found themselves to be Level 4 or 5 in eight of nine milestones. Only 47% found themselves to be Level 4 or 5 in ultrasound skills ( $p = 0.0001$ ).

**CONCLUSIONS:**

Although a majority of EM attendings reported meeting Level 4 milestones, many felt they did not meet Level 4 criteria. Attendings report less perceived competence in ultrasound skills than other milestones. It is unclear if self-assessments reflect the true competency of practicing attendings. The study design can be useful to define the accuracy, precision, and validity of milestones for any medical field.

**Physician Health and Wellness**

McClafferty H, Brown OW; Section on Integrative Medicine; Committee on Practice And Ambulatory Medicine; Section on Integrative Medicine. Pediatrics. 2014 Oct;134(4):830-5. doi: 10.1542/peds.2014-2278.

**ABSTRACT:**

Physician health and wellness is a critical issue gaining national attention because of the high prevalence of physician burnout. Pediatricians and pediatric trainees experience burnout at levels equivalent to other medical specialties, highlighting a need for more effective efforts to promote health and well-being in the pediatric community. This report will provide an overview of physician burnout, an update on work in the field of preventive physician health and wellness, and a discussion of emerging initiatives that have potential to promote health at all levels of pediatric training. Pediatricians are uniquely positioned to lead this movement nationally, in part because of the emphasis placed on wellness in the Pediatric Milestone Project, a joint collaboration between the Accreditation Council for Graduate Medical Education and the American Board of Pediatrics. Updated core competencies calling for a balanced approach to health, including focus on nutrition, exercise, mindfulness, and effective stress management, signal a paradigm shift and send the message that it is time for pediatricians to cultivate a culture of wellness better aligned with their responsibilities as role models and congruent with advances in pediatric training. Rather than reviewing programs in place to address substance abuse and other serious conditions in distressed physicians, this article focuses on forward progress in the field, with an emphasis on the need for prevention and anticipation of predictable stressors related to burnout in medical training and practice. Examples of positive progress and several programs designed to promote physician health and wellness are reviewed. Areas where more research is needed are highlighted.

**The Milestones Passport: A Learner-Centered Application of the Milestone Framework to Prompt Real-Time Feedback in the Emergency Department**

Yarris LM, Jones D, Kornegay JG, Hansen M. (2014) The Milestones Passport: A Learner-Centered Application of the Milestone Framework to Prompt Real-Time Feedback in the Emergency Department. *Journal of Graduate Medical Education*: September 2014, Vol. 6, No. 3, pp. 555-560.

**BACKGROUND:**

In July 2013, emergency medicine residency programs implemented the Milestone assessment as part of the Next Accreditation System.

**OBJECTIVE:**

We hypothesized that applying the Milestone framework to real-time feedback in the emergency department (ED) could affect current feedback processes and culture. We describe the development and implementation of a Milestone-based, learner-centered intervention designed to prompt real-time feedback in the ED.

**METHODS:**

We developed and implemented the Milestones Passport, a feedback intervention incorporating subcompetencies, in our residency program in July 2013. Our primary outcomes were feasibility, including faculty and staff time and costs, number of documented feedback encounters in the first 2 months of implementation, and user-reported time required to complete the intervention. We also assessed learner and faculty acceptability.

**RESULTS:**

Development and implementation of the Milestones Passport required 10 hours of program coordinator time, 120 hours of software developer time, and 20 hours of faculty time. Twenty-eight residents and 34 faculty members generated 257 Milestones Passport feedback encounters. Most residents and faculty reported that the encounters required fewer than 5 minutes to complete, and 48% (12 of 25) of the residents and 68% (19 of 28) of faculty reported satisfaction with the Milestones Passport intervention. Faculty satisfaction with overall feedback in the ED improved after the intervention (93% versus 54%,  $P = .003$ ), whereas resident satisfaction with feedback did not change significantly.

**CONCLUSIONS:**

The Milestones Passport feedback intervention was feasible and acceptable to users; however, learner satisfaction with the Milestone assessment in the ED was modest.

**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.



**Medical Student Milestones in Emergency Medicine**

Santen SA, Peterson WJ, Khandelwal S, House JB, Manthey DE, Sozener CB. Acad Emerg Med. 2014 Aug;21(8):905-11. doi: 10.1111/acem.12443. Epub 2014 Aug 24.

**OBJECTIVES:**

Medical education is a continuum from medical school through residency to unsupervised clinical practice. There has been a movement toward competency-based medical education prompted by the Accreditation Council for Graduate Medical Education (ACGME) using milestones to assess competence. While implementation of milestones for residents sets specific standards for transition to internship, there exists a need for the development of competency-based instruments to assess medical students as they progress toward internship. The objective of this study was to develop competency-based milestones for fourth-year medical students completing their emergency medicine (EM) clerkships (regardless of whether the students were planning on entering EM) using a rigorous method to attain validity evidence.

**METHODS:**

A literature review was performed to develop a list of potential milestones. An expert panel, which included a medical student and 23 faculty members (four program directors, 16 clerkship directors, and five assistant deans) from 19 different institutions, came to consensus on these milestones through two rounds of a modified Delphi protocol. The Delphi technique builds content validity and is an accepted method to develop consensus by eliciting expert opinions through multiple rounds of questionnaires.

**RESULTS:**

Of the initial 39 milestones, 12 were removed at the end of round 1 due to low agreement on importance of the milestone or because of redundancy with other milestones. An additional 12 milestones were revised to improve clarity or eliminate redundancy, and one was added based on expert panelists' suggestions. Of the 28 milestones moving to round 2, consensus with a high level of agreement was achieved for 24. These were mapped to the ACGME EM residency milestone competency domains, as well as the Association of American Medical Colleges (AAMC) core entrustable professional activities for entering residency to improve content validity.

**CONCLUSIONS:**

This study found consensus support by experts for a list of 24 milestones relevant to the assessment of fourth-year medical student performance by the completion of their EM clerkships. The findings are useful for development of a valid method for assessing medical student performance as students approach residency.

**Entrustment and Mapping of Observable Practice Activities for Resident Assessment**

Warm EJ, Mathis BR, Held JD, Pai S, Tolentino J, Ashbrook L, Lee CK, Lee D, Wood S, Fichtenbaum CJ, Schauer D, Munyon R, Mueller C. *J Gen Intern Med.* 2014 Aug;29(8):1177-82. doi: 10.1007/s11606-014-2801-5. Epub 2014 Feb 21.

**ABSTRACT:**

Entrustable Professional Activities (EPAs) and the Next Accreditation System reporting milestones reduce general competencies into smaller evaluable parts. However, some EPAs and reporting milestones may be too broad to use as direct assessment tools. We describe our internal medicine residency curriculum and assessment system, which uses entrustment and mapping of observable practice activities (OPAs) for resident assessment. We created discrete OPAs for each resident rotation and learning experience. In combination, these serve as curricular foundation and tools for assessment. OPA performance is measured via a 5-point entrustment scale, and mapped to milestones and EPAs. Entrustment ratings of OPAs provide an opportunity for immediate structured feedback of specific clinical skills, and mapping OPAs to milestones and EPAs can be used for longitudinal assessment, promotion decisions, and reporting. Direct assessment and demonstration of progressive entrustment of trainee skill over time are important goals for all training programs. Systems that use OPAs mapped to milestones and EPAs provide the opportunity for achieving both, but require validation.

**Practice Quality Improvement during Residency: Where Do We Stand and Where Can We Improve?**

Choudhery S, Richter M, Anene A, Xi Y, Browning T, Chason D, Morriss MC. Acad Radiol. 2014 Jul;21(7):851-8. doi: 10.1016/j.acra.2013.11.021. Epub 2014 May 13.

**RATIONALE AND OBJECTIVES:**

Completing a systems-based practice project, equivalent to a practice quality improvement project (PQI), is a residency requirement by the Accreditation Council for Graduate Medical Education and an American Board of Radiology milestone. The aim of this study was to assess the residents' perspectives on quality improvement projects in radiology.

**MATERIALS AND METHODS:**

Survey data were collected from 154 trainee members of the Association of University Radiologists to evaluate the residents' views on PQI.

**RESULTS:**

Most residents were aware of the requirement of completing a PQI project and had faculty mentors for their projects. Residents who thought it was difficult to find a mentor were more likely to start their project later in residency ( $P < .0001$ ). Publication rates were low overall, and lack of time was considered the greatest obstacle. Having dedicated time for a PQI project was associated with increased likelihood of publishing or presenting the data ( $P = .0091$ ). Residents who rated the five surveyed PQI steps (coming up with an idea, finding a mentor, designing a project, finding resources, and finding time) as difficult steps were more likely to not have initiated a PQI project ( $P < .0001$  for the first four and  $P = .0046$  for time).

**CONCLUSION:**

We present five practical areas of improvement to make PQI a valuable learning experience: 1) Increasing awareness of PQI and providing ideas for projects, 2) encouraging faculty mentorship and publication, 3) educating residents about project design and implementation, 4) providing resources such as books and funds, and 5) allowing dedicated time.

### 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.

**Specialty Milestones and the Next Accreditation System: An Opportunity for the Simulation Community**

Beeson MS, Vozenilek JA. *Simul Healthc*. 2014 Jun;9(3):184-91. doi: 10.1097/SIH.0000000000000006.

**ABSTRACT:**

The Accreditation for Graduate Medical Education has developed a new process of accreditation, the Next Accreditation System (NAS), which focuses on outcomes. A key component of the NAS is specialty milestones-specific behavior, attributes, or outcomes within the general competency domains. Milestones will mark a level of proficiency of a resident within a competency domain. Each specialty has developed its own set of milestones, with semiannual reporting to begin July 2013, for 7 specialties, and the rest in July 2014. Milestone assessment must be based on objective data. Each specialty will determine optimal methods of measuring milestones, based on ease, cost, validity, and reliability. The simulation community has focused many graduate medical education efforts at training and formative assessment. Milestone assessment represents an opportunity for simulation modalities to offer summative assessment of milestone proficiencies, adding to the potential methods that residency programs will likely use or adapt. This article discusses the NAS, milestone assessment, and the opportunity to the simulation community to become involved in this next stage of graduate medical education assessment.

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

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

**ABSTRACT:**

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

### **Survey of Developmental Milestones in Internal Medicine among Residents and Faculty**

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

#### **OBJECTIVES:**

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

#### **METHODS:**

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

#### **RESULTS:**

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

#### **CONCLUSIONS:**

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

focus on how learners might better understand and refine the milestone evaluation process.

### **Progress toward Improved Leadership and Management Training in Pathology**

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

#### **CONTEXT:**

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

#### **OBJECTIVE:**

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

#### **DATA SOURCES:**

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

#### **CONCLUSIONS:**

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



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

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

**BACKGROUND:**

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

**METHODS:**

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

**RESULTS:**

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

**CONCLUSIONS:**

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

## **The Pathology Milestones and the Next Accreditation System**

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

### **BACKGROUND:**

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

### **OBJECTIVE:**

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

### **DATA SOURCES:**

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

### **CONCLUSIONS:**

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

**Time to Trust: Longitudinal Integrated Clerkships and Entrustable Professional Activities**

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

**ABSTRACT:**

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

**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 ACGME Milestone Project in Ophthalmology**

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

#### **ABSTRACT:**

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

### **The Development of the Emergency Medicine Milestones**

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

#### **ABSTRACT:**

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