Leaders of competency-based medical education (CBME) are drawn to the concept of entrustable professional activities (EPAs), which are likely the most widespread worldwide approach to CBME at this time.\(^1\)\(^-\)\(^9\) Despite the seemingly universal affinity for EPAs, empirical evidence for their use in assessment and results of implementation in clinical contexts are just emerging.\(^10\)\(^-\)\(^15\) This supplement collates papers from international leaders across a range of specialties and countries for the purpose of presenting the leading edge knowledge and thinking regarding empiric evidence and implementation experiences for EPA-based curricula and assessment. In this Foreword, we highlight key concepts presented in this supplement for consideration and action as the medical education community more broadly implements EPAs, fills remaining gaps with continued EPA-based research, and develops the vision and agenda for the next decade of CBME advancement.

EPA Phenotypes Vary: Opportunities for Aligning Across Training Stages and Specialties

With prolific efforts to define sets of EPAs over the past decade, it is clear that varied EPA phenotypes exist. These phenotypes may vary based on whether they define a stage of training, or a profession. Phenotype differences may also reflect the regulatory oversight in various countries, with some having a single regulatory body that facilitates EPAs across specialties and stages of training and practice. This structure requires backward visioning from the specific EPAs of a profession to the phases of graduate medical education (GME) (i.e., fellowship and residency) and ultimately to the generic core EPAs for undergraduate medical education (UME). Schwartz et al illustrate how it is possible to connect EPAs across the full continuum of training, even in the context of the fragmented design currently in place in the United States.\(^17\)

Their article is the first published work to assess individual trainees across the full continuum of medical education from UME through GME (both residency and fellowship), linking EPAs designed for stages of training with those that were intentionally designed to define a profession. This article describing the American pediatric experience reinforces previously published efficiencies afforded by aligning stages of training in a manner that has already enabled time-variable advancement of medical students to residency earlier than time-based norms.\(^18\) While this pilot work has not yet been scaled, it opens the door for broader implementation by demonstrating the reality of time-variable transitions even in the current structure of medical education in the United States.

Indeed, ten Cate and colleagues present the Dutch experience with implementing EPAs across specialties nationally and how these efforts have similarly allowed time-variable training, meeting the goals of educators, while also facilitating the Dutch government goal of cutting costs for medical education as a whole.\(^19\) We believe competency-based, time-variable training is the future, and the articles in the supplement demonstrate the practical use of EPAs in ultimately achieving this goal. Our vision for the future is continued expansion and escalation of this type of work to align EPA phenotypes worldwide in the next decade as more wide-ranging implementation continues.

One step toward seeing this vision come to fruition is underscored by the call made by ten Cate and colleagues to increase focus on EPAs that cross professions and specialties.\(^20\) An example they provide are EPAs focused on ultrasound imaging that is now commonly performed by several specialties beyond radiology. Lindeman and colleagues provide another example from surgery.\(^21\) One of the initial 5 EPAs that they created to define their specialty is: “Provide general surgical consultation to other health care providers.” Providing consultation is likely applicable to most, if not all, specialties with a single-word substitution for the name of the specialty.

We also suspect that mastery of this EPA across specialties is quite similar. Thus, sharing the tasks associated with performing this EPA with other disciplines could benefit their efforts to define EPAs and enhance collaboration across specialties. Such work may result in economies of scale to advance EPAs across specialties in a more expeditious manner.

We believe the work of Lindeman and colleagues also highlights how learning and alignment of care can be facilitated across specialties even if EPAs are not shared.\(^22\) They took an approach to developing EPAs for general surgery that firmly rejected reducing the work of a surgeon to a technician that performs a series of procedures. Rather, they view the surgeon as a professional that cares for patients before, during, and following surgeries; performs important activities that are not related to procedures; and uses clinical reasoning to approach symptomatology before a diagnosis is reached. Following these
guiding principles, they did not develop an EPA focused on “performing an appendectomy” and rather developed one focused on managing a patient presenting with right lower quadrant pain. This approach lends itself to cross-disciplinary alignment that can benefit multiple disciplines and specialties given that many types of providers and specialists routinely manage patients with right lower quadrant pain, including pediatrics, emergency medicine, internal medicine, obstetrics and gynecology, and radiology. We envision the curricular aspects of this EPA facilitating cross-disciplinary learning and patient management approaches that not only align care across specialties but streamline and improve care to patients in the process.

EPA Genotypes Are Consistent: Identifying the Core Components Needed to Distinguish a Professional Activity as an EPA and Implementing It as Intended

While phenotypes of EPAs differ to meet needs of specialties and stages of training based on regulatory and logistic needs, over a decade into work with EPAs, it appears clear that EPA genotypes should not vary. The basic structure has been detailed by ten Cate et al and is not typically debated. The international EPA genome project is also underway and includes researchers throughout the world, and a recent article seeks to clarify key terminology in entrustment language with the goal of encouraging a common lexicon. Furthermore, an attempt at identifying core components for EPA implementation has been completed. As a common genome for EPAs crystallizes, it will be important to surveil for both advantageous and deleterious mutations that promote long-term sustainability of EPAs or threaten their longevity, respectively.

EPAs Bring the Patient Into the Training and Assessment Equation Only If We Make Sure They Do

Scholars have written about the ability of EPAs to bring the patient into the assessment equation in a manner not afforded by other approaches to training and assessment because their main focus is based on the outcome of safe and effective care delivery. To this end, ten Cate and colleagues argue that their impact on patients is a key consideration for the coming years as we advance EPA-based assessment efforts. Indeed, a just emerging approach to trainee assessment, using resident-sensitive quality measures, seeks to link patient outcomes with education outcomes. However, as Sebok-Seyer and colleagues note, patients only find themselves in the foreground of our EPA-based training and assessment efforts if we ensure they are positioned there. This placement cannot be left to chance. Rather, patients must be intentionally brought to the table where EPAs for a specialty are being defined and be involved in training and improving care related to these activities. Equally important, EPAs should seek to explicitly evoke a focus on patients rather than placing undue balance of focus on trainees alone. However, even the best EPA descriptions can foster patient-centered or non–patient-centered care, and both intentional design and implementation are required to achieve the former.

Ensuring Learner Agency in EPA-Based Assessment Efforts

As Sebok-Syer and colleagues note, trainees may currently be unintentionally efficaciously patients in EPA-based efforts. However, bringing patients to the forefront must also not efface trainees in the process. CBME advocates placing the learner in the driver’s seat for learning. While giving learner’s control in the assessment process, recent work by Schut and colleagues have found that increasing trainees’ ownership and agency in their assessments can facilitate lifelong learning skill development and also shift their perceptions of assessment from higher stakes to lower stakes. When learners perceive assessment as high stakes, they are more likely to lose sight of its formative aspects and less likely to use it to promote learning. The Minnesota Method presented by Hobday and colleagues is an exemplar approach to granting agency to learners by giving them primary responsibility for collecting frequent EPA-based workplace assessments. This approach generates a greater number and variety of assessments, serving to enrich feedback and help each student develop an individual leaning plan. In the aggregate, these assessments inform a dashboard that is helpful to both students and programs. Furthermore, the work of Violato and colleagues demonstrates validity evidence for this approach to assessment.

Navigating Tensions in Assessment and Feedback

Kinnear and colleagues present a model approach for developing and refining validity arguments for a program of assessment. While programmatic assessment is important to ensuring robust data that enables committees and programs to make summative decisions about trainee advancement, articles from Kinnear et al and Ginsburg et al highlight the challenge that placing an undue emphasis on summative decision making (assessment of learning) can have on limiting the educational value of assessment efforts (assessment for learning) such as promoting learner agency. In the former article, they note the tension in using assessment data to perform the double duty of providing formative feedback to trainees as well as inform summative decisions about performance. In the latter article, they question whether written comments in assessment should even be asked to serve both purposes, arguing that the lexicon used to help trainees develop is not necessarily the same as that used to report their performance to others. They posit opportunity should be made for both uses. Managing these tensions in the coming decade should receive high priority as both programmatic assessment and qualitative assessment continue to receive substantial focus. The need for learning analytics is greatly magnified by this proposed need for additional qualitative assessment data capture for each trainee assessment.

Does Supervised Practice End at Graduation?

Two articles in the supplement highlight trainees finishing stages of training without being deemed ready to transition to the next stage based on EPA assessments. This is not the first time such end-of-training gaps in EPA-based assessment efforts have been described. As Amiel and colleagues note, one explanation for deficiencies in some EPAs may be that trainees are not afforded the opportunity to advance or perhaps only afforded the opportunity to demonstrate performance at higher levels shortly before graduation such that gathering
sufficient evidence about performance is challenging or impossible. In addition, we are also concerned that these findings may represent gaps in training that lead to graduating learners who are not ready for the next stage of training or for unsupervised practice. This concern seems to be borne out over the past few decades by fellowship director concerns that recent residency graduates are not ready to enter fellowship, department chair reports that new faculty are not prepared to perform routine tasks of the specialty, residents conveying their lack of readiness to provide care routine in their field, and training directors commenting they would not want their own graduates to care for their family members.

If these performance gaps are not anticipated and addressed, the implications for training and practice are great. As Turner and colleagues highlight, this issue may require us to rethink what transitions from training to practice look like and what supervisory structures may need to be in place to ensure these transitions are safe for patients. This challenge also has remarkable implications for the structure and approach of current training programs. EPAs can only help us ensure we meet the needs of patients if they drive necessary curriculum to ensure trainees achieve educational outcomes that equip them to meet those needs. As Sebok-Syer and colleagues note, this is only possible if we view EPAs as informing both our curricular efforts and our assessment efforts.

EPAs, as important contributors to curriculum, are also highlighted as a component of the research agenda by ten Cate et al, where they note the importance of “using EPAs across the educational continuum and into practice.” We believe this topic deserves crucial focus given the current known limitations of training, which are further compounded by the explosion of knowledge and technology that abolishes any notion that structured learning ends with training. In the current world, EPAs provide a bridge across the abyss that exists in learning and assessment between training and practice and create an opportunity for such a structure.

**Fluidity of EPAs Over Time**

Articles from Lindeman and colleagues as well as Amiel and colleagues highlight that EPAs for a given field should not be viewed as static. In the case of Lindeman and colleagues, they took a pragmatic approach to developing EPAs for general surgery, electing to start with 5 that had consensus as core to the specialty while they negotiated additional EPAs that broadly define the specialty. The experience of Amiel and colleagues follows extensive work implementing the Association of American Medical Colleges’ (AAMC) Core EPAs for Entering Residency (CEPAERs) at multiple schools. These experiences led them to reflect on EPAs that should perhaps be added, including educating patients about their illness, motivational interviewing, and providing telemedicine services. For us, these examples highlight both EPAs not included in the first iteration that are worthy of consideration as well as clear changes in the practice of medicine (telemedicine) since the AAMC CEPAERs were published.

Moving forward, it will be important for groups defining EPAs for given specialties to remain sensitive to EPAs that should be added and removed based on fundamental changes in practice. One possible way to ensure that a profession’s EPAs keep pace with the discipline is to align them with a regulatory oversight process intended to accomplish updating for other purposes. For example, in the United States, some member boards of the American Board of Medical Specialties perform recurring practice analyses to ensure that content specifications for certifying examinations are up to date. Ensuring that EPAs are always aligned with these, practice analysis updates would provide a system of checks and balances to keep EPAs focused on what is important for the profession, achieving a feedback loop between assessing EPAs and using identified gaps to improve curriculum, as advocated by ten Cate and colleagues.

**What Is Preposterous, Possible, and Plausible in the Next 10 Years?**

Looking ahead to the next decade, it is important to go beyond the plausible and even the possible and begin envisioning what some would call preposterous. As the articles in this supplement illustrate, we have gone from thinking of learning analytics as a dream and linking patient and learner outcomes as the unreachable Holy Grail a decade ago, to seeing this uncharted territory appear on the map as plausible.

van der Vleuten and Schuwirth recently wrote about phases of assessment over the past 5 decades, detailing 3 phases. All workplace-based assessments, including EPAs, fit well in the second phase, assessment as judgment, and current third phase focused on assessment as a system. Looking forward, Lentz et al predict an evolution of the third phase to focus on assessment as a sociotechnical system where artificial intelligence becomes a collaborator amongst learners, faculty, patients, and the clinical learning environment. As medical educators, we must work collectively to thoughtfully integrate these technologies in ways that further assessment for learning, that ultimately leads to improved patient outcomes and experiences.

What seems preposterous at this moment in time is putting aside the politics involved in medical education; the competition among us and our institutions; and working together to make competency-based education, training, and practice a seamless continuum with meaningful assessment and feedback. A central focus on the patient must be a hallmark of every phase. As ten Cate and colleagues elaborate, “the increasingly complex and variable learning environment where the work of CBME and EPA implementation occurs constitutes an intriguing yet daunting area for further exploration” in the coming decade. The foundation of CBME is taking a learner-centered and patient-focused approach, both of which are fully achievable if we desire to achieve them. Our hope is that we can look back on the ensuing decade as we have just done for this past decade and emerge with feelings of gratitude and a sense of accomplishment for what we have been able to do together for the benefit of our patients and learners.

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References


