

Fidelity to Best Practices in EPA Implementation: Outcomes Supporting Use of the Core Components Framework From the University of Virginia Entrustable Professional Activity Program

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Abstract

Problem

The rapid expansion of entrustable professional activity (EPA) assessment programs has led to calls to ensure fidelity in implementation and integrity in meeting the goals of competency-based medical education. Initiated in July 2017, in advance of the articulated core components of EPA implementation, this article describes the structure and outcomes of the University of Virginia (UVA) EPA Program and provides support for the identified essential components.

Approach

The UVA EPA Program includes workplace assessments by residents/fellows, attending faculty, and master assessors (MAs), experienced clinicians who assess students across disciplines

and clinical settings. All assessors participate in formal professional development and provide verbal and written comments to support their supervision ratings. The Entrustment Committee, composed of 12 MAs, uses a shared mental model and aggregates all assessor data to make a high-stakes summative entrustment decision about students' readiness to assume the role of an acting intern.

Outcomes

Since 2017, over 2,000 assessors have completed 56,969 EPA assessments for 1,479 students. Ninety-four percent of assessments have been done during the clerkship phase. Residents/fellows have completed a mean of 18 assessments, attending faculty a mean of 27, and MAs a mean of 882.

Seventy-four percent of observed encounters involved patients with acute concerns with or without a co-morbid condition. Fifty percent of assessments occurred in inpatient and 32% in ambulatory settings. Eighty-seven percent of assessments contained narrative comments with more than 100 characters.

Next Steps

Planned next steps will include earlier identification of students who require individualized learning to promote the development of skills related to EPAs, expansion of the remediation program to enable more students to engage in a clinical performance mastery elective, and creation of targeted professional development for assessors to reinforce the tenets of the EPA program.

Problem

The design of educational programs is grounded by learning theories and well-accepted best practice models. Just as implementation science seeks to understand the methods used to translate evidence-based models or theories into practice,¹ the rapidly expanding implementation of competency-based programs of assessment using entrustable professional activities (EPAs) has led

to calls to ensure fidelity with the educational theories that underlie this framework and integrity in meeting the goals of competency-based medical education.^{2,3} Specifically, implementation of EPA programs of assessment requires an examination of the structural and contextual factors that enable assessment of learner performance using direct observation in the workplace and the use of criteria defining a learner's need for supervision to prospectively determine a learners' readiness to perform tasks in novel situations (i.e., adaptive competence).⁴

The process used to summarize educational theories underlying key aspects of competency-based medical education and programmatic assessment⁵ laid a foundation for establishing the essential elements of EPA programs and underscored the importance of learners' agency and accountability within a system that provides longitudinal opportunities to receive information and feedback

about performance. Core components of EPA assessment have been proposed to guide and evaluate implementation.² In this article, we describe the structure and outcomes of the University of Virginia (UVA) EPA program. Initiated in July 2017, in advance of the articulated core components of EPA implementation, our real-world experience of implementing a novel program of assessment integrated with systematic professional development for students and assessors and with systems to support students corroborates the core components of EPA implementation.⁶ Aligned with Kane's framework for assessment validity,⁷ we present data from workplace-based EPA assessments that incorporate supervision ratings (scoring) and narrative comments based on a shared understanding of cross-discipline performance expectations (generalization). Highlighted are the processes used to foster learners' ongoing development and make prospective decisions (extrapolation) about a learner's need for individual intervention

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and readiness to assume higher-level, additional patient care responsibilities (implications).⁷

Approach

Web-enabled applications to support the infrastructure and processes of the UVA EPA Program were created within our institutionally developed learning management system, VMED. Scheduling tools allow students to request assessments from master assessors (MAs), experienced clinicians with expertise in assessment, and set up longitudinal meetings with faculty clinical performance coaches who cocreate individual learning plans with students using data from EPA assessments. Assessments are requested and completed in iCAN (iClinical Activity Navigator; see Supplemental Digital Appendix 1 at <http://links.lww.com/ACADMED/B326>). Once requested, assessors are notified via email and/or text that they have an assessment to complete. User guides, frequently asked questions, performance expectations for each EPA, assessment requirements for

each course, and the supervision scale are posted for students and assessors (see Supplemental Digital Appendixes 2 and 3 at <http://links.lww.com/ACADMED/B326>). Stakeholder groups (students, faculty coaches, student affairs deans, the Entrustment Committee [EC], and course directors and coordinators) have access to specific data visualizations (see Supplemental Digital Appendix 4 at <http://links.lww.com/ACADMED/B326>). EPA program administrators monitor learners' completion of requirements using a specific compliance analytics page. Program leaders use compliance data to determine if a professionalism concern card should be submitted when a student does not complete required assessments. Importantly, program administrators and the interval reports created by the EC remind students that sufficient performance information from all assessor types and all courses is needed to make a summative entrustment decision.

Below we outline key processes and infrastructure within the UVA EPA Program to illustrate alignment with

one or more of the core components of EPA implementation (as indicated by the subsection headings).² The UVA institutional review board determined that evaluation of the program was exempt from further review (IRB #2396).

Workplace assessment

The Association of American Medical Colleges Core EPAs for Entering Residency⁸ are assessed in the clinical workplace through direct observation during authentic encounters with patients across all 3 phases of our curriculum (i.e., the preclerkship, clerkship, and postclerkship phases) in ambulatory, inpatient, emergency, operative, or chronic care settings. Students request assessments from 3 types of assessors: residents and fellows, attending faculty with discipline-specific expertise, and MAs who are specifically trained to complete assessments across disciplines and clinical settings (Figure 1).⁶ Students are observed conducting encounters with healthy patients and patients with acute and chronic concerns and comorbid conditions. Thus far, we have assessed the following EPAs: history/physical




	STUDENT 	TRAINED ASSESSORS  Attending faculty, residents/fellows, and master assessors from all clinical training sites	ENTRUSTMENT COMMITTEE  Composed of master assessors from main and regional campuses
TRAINING	<ul style="list-style-type: none"> • Orientation to workplace-based assessment, process, tools, and EPA assessment requirements for each phase and course/clerkship • Near-peer support from students in next phase of curriculum 	<ul style="list-style-type: none"> • Professional development to enhance direct observation skills and establish shared frame of reference • Hands-on practice to apply EPA criteria and translate into a supervision rating—performance dimension training 	<ul style="list-style-type: none"> • Additional development to enhance direct observation skills outside area of clinical expertise • Training on group decision-making to establish norms for integration of quantitative and qualitative data
RESPONSIBILITIES	<ul style="list-style-type: none"> • Initiate assessment requests and accept accountability for completing EPA requirements • Monitor progress with faculty coach • Participate in skill development sessions 	<ul style="list-style-type: none"> • Accept assessment requests • Directly observe students during patient encounters and provide written and verbal feedback • Complete assessments including written comments to support supervision rating 	<ul style="list-style-type: none"> • Complete assessments across various disciplines and clinical settings • Provide verbal and written feedback after assessments and in interval and summative reports • Submit end of phase summative decisions

Figure 1 Stakeholder roles in the University of Virginia Entrustable Professional Activity (EPA) Program. This chart outlines the training and responsibilities of students and assessors (including attending faculty, residents/fellows, and master assessors). Master assessors, who form the Entrustment Committee, receive additional training to be able to complete assessments across various disciplines and clinical settings and to establish the norms and processes required to apply a shared mental model in group decision making.

exam, differential diagnosis, screening/diagnostic tests, orders/prescriptions, notes, oral presentations, clinical questions, and general procedures; the number of specific EPA requirements for each course are posted (see Supplemental Digital Appendix 2 at <http://links.lww.com/ACADMED/B326>). In general, for each course, students are required to complete assessments for each EPA with each type of assessor (see Supplemental Digital Appendix 3 at <http://links.lww.com/ACADMED/B326>).

Outcomes-based and construct alignment

All students and assessors participate in formal professional development (Figure 1).⁶ Performance expectations for each EPA, posted for students and assessors on VMED and based on established tools in the literature, outline observed behaviors for a learner who requires more supervision and for a learner whose performance indicates they are ready for indirect supervision (i.e., ready for day one of residency). The professional development

training sessions for assessors include facilitated exercises during which participants translate observation of a standardized student performing an EPA into a decision about the level of supervision needed the next time the student participates in a similar patient encounter.⁶ This exercise provides assessors with the opportunity to practice using an adapted prospective entrustment-supervision scale.⁹ Feedback from assessors about how they make decisions to grant autonomy in the clinical environment informed modifications made to the scale after the initial year of program implementation. Assessors determine if a student is ready to observe a supervisor doing the EPA, do the EPA together with a supervisor, be observed doing the EPA with guidance from a supervisor only if needed, or do the EPA without the need for guidance from a supervisor during performance.

Qualitative data

All assessors provide verbal and written comments to support their supervision ratings and include information about

the student's strengths and areas for development. Assessors submit their supervision rating and narrative comments within 72 hours of observing an encounter. During the training sessions assessors practice providing high-quality feedback that is specific to the encounter that was observed.⁶ The information from these ad hoc assessments is available immediately and incorporated into data visualizations for students and their longitudinal coaches (Figure 2). Students and coaches meet regularly and cocreate individualized learning plans using the information from EPA assessments and other evaluations of clinical performance.¹⁰ Clinical course directors are able to access narrative comments provided by assessors in their department to allow them to provide individual professional development as needed to enhance colleagues' assessment and feedback skills.

Informed committee members, value of the collective, and shared local mental model

The EC is composed of the 12 MAs from our main and regional campuses.

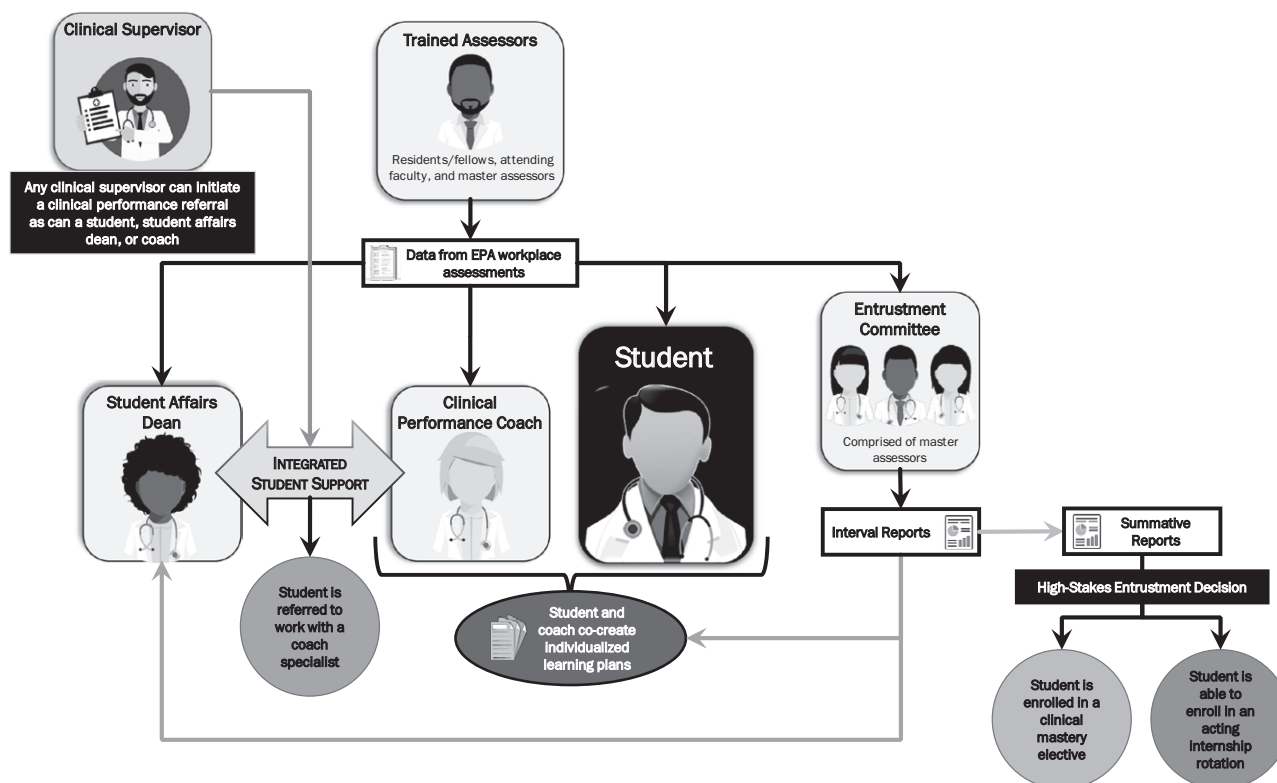


Figure 2 Integration of the University of Virginia Entrustable Professional Activity (EPA) Program with systems for student support. This schematic demonstrates how the EPA assessment program is integrated with systems to support student learning and development, including academic, personal, professional development advising by student affairs deans; clinical performance development and coregulation of learning by longitudinal faculty coaches; and individualized skill development by master assessors or coach specialists during an elective to prepare students to enroll in an acting internship rotation. Entrustment Committee members aggregate and interpret data from assessments to create interval reports that contribute to students' ongoing learning and document summative decisions.

The MAs have engaged in extensive training sessions to prepare them for their role as ad hoc assessors and to lay the foundation for the group to analyze data for summative entrustment decision making.^{6,9} The MAs' role as assessors enables them to have first-hand knowledge of performance expectations and how to apply the criteria to assign a supervision rating. This knowledge and their access to interactive data visualizations allows them to aggregate all assessor data; interpret a student's performance across a course, a curricular phase, and the entire curriculum; and predict a student's readiness to assume the role of an acting intern (Figures 1 and 2). EC members do a primary review of a defined student cohort and lead discussions about individual students during committee meetings.

The EC shares feedback with students, faculty coaches, and student affairs deans in interval reports generated at regular time periods in advance of making their summative decision (Figures 1 and 2).

MAs also share information from ad hoc assessments with coaches and student affairs deans as necessary to ensure students receive the support they need. Concerns about nonacademic issues that may be affecting performance are fed forward to student affairs deans and concerns about clinical performance are communicated to coaches and deans so that an integrated plan for support can be created (Figure 2).

Performance prediction and high-stakes entrustment decisions

EPA assessments do not contribute to course grades. The EC uses EPA data from the clerkship phase to determine whether a student is ready to assume the role of an acting intern in the postclerkship phase (Figure 2). The EC meets during each clerkship block and twice during the final block of the year to create a formal report summarizing the student's performance. Interval reports contribute to students' learning plans. EC discussions lead to a decision about individual students and also advances the group's effectiveness in making

high-stakes entrustment decisions (Figure 1).

Entrustment decision consequences

At any time, a student, coach, student affairs dean, or assessor can make a clinical performance referral to initiate the process for a student to engage in additional learning activities to enhance their clinical performance during intersession courses in the clerkship phase or in one-on-one work with a coach specialist with expertise in teaching specific skills, such as clinical reasoning, organization, time management, communication, or professionalism (Figure 2). In addition, at the end of the clerkship phase, any student who the EC believes is not yet ready to take on the responsibilities of an acting intern is discussed by the Academic Standards and Achievement Committee to determine if the student needs to enroll in a clinical performance mastery elective, in which the student works one-on-one with an MA or a coach specialist and is observed, assessed, and given feedback during authentic patient encounters.

Table 1

Summary of Completed UVA EPA Program Assessments, CYs 2017–Present (July 2017–August 2021)

CY	EPA assessments by curricular phase, no. ^{a,b}		
	P1	P2	P3
2017–2018 (pilot in P2)		1,122	
2018–2019 (implementation in P1 and P2; pilot in P3)	308	8,168	64
2019–2020	317	13,171	256
2020–2021 (implementation in P3)	1,115	18,297	311
2021–present ^c		12,525	1,315
Total	1,740	53,283	1,946
Total students assessed	524	765	190
Assessments per student since 2017, mean (maximum)	3 (10)	69 (166)	10 (175)
CY	EPA assessments completed by assessor type, no. ^d		
	R/F	A	MA
2017–2018	389	555	178
2018–2019	3,210	3,808	1,522
2019–2020	4,716	4,812	4,216
2020–2021	6,508	9,412	3,803
2021–present ^c	5,545	6,298	1,997
Total	20,368	24,885	11,716

Abbreviations: UVA, University of Virginia; EPA, entrustable professional activity; CY, curricular year (March–February); P1, pre-clerkship phase of curriculum; P2, clerkship phase of curriculum; P3, post-clerkship phase of curriculum; R/F, resident/fellow; A, attending faculty; MA, master assessor.

^aUnless otherwise noted.

^bThe curriculum includes 3 phases: Students complete specified assessments during authentic patient encounters during P1 in the longitudinal Foundations of Clinical Medicine course, during P2, and in required courses during P3.

^cIncludes data from March 1 to August 6, 2021, for assessments done during P2 and P3. No P1 assessments were completed in that time period.

^dAssessments were completed by over 2,000 assessors of 3 types: R/Fs, As, and MAs.

Outcomes

Since 2017, over 2,000 assessors have completed 56,969 assessments of authentic patient encounters providing supervision ratings (scoring) for 1,479 students (Table 1). Consistency in scoring by assessors has been previously reported.⁶ Students have been assessed across each of the 3 phases of the curriculum (generalization). Ninety-four percent of assessments have been done during the clerkship phase. The mean number of assessments per student since program implementation has been 3 for the preclerkship phase (implementation in 2018), 69 for the clerkship phase (implementation in 2018), and 10 for the postclerkship phase (implementation in 2020). Twelve MAs have completed a mean of 882 assessments. Residents/fellows have completed a mean of 18 assessments and 37% of clerkship phase assessments; attending faculty have completed a mean of 27 assessments and 42% of clerkship phase assessments. Fifty percent of assessments occurred in inpatient settings and 32% were in ambulatory settings. Seventy-four percent of observed encounters involved patients with acute concerns with or without a comorbid condition. Eighty-seven percent of assessments had narrative comments with more than 100 characters.

The EC has made summative entrustment decisions (extrapolation) for 493 students (158 in 2019–2020, 176 in 2020–2021, and 159 in 2021–2022) as of August 2021. The summative decision is based on an analysis of all available EPA data—that is, supervision ratings plus narrative comments. Entrustment indicates readiness to perform an EPA with indirect supervision and to take on the responsibilities of an acting intern. Thirteen students (5 in 2019–2020 and 8 in 2020–2021) were deemed to be not yet ready to enroll in an acting internship and have completed the mastery elective (implications). Two students have been referred to work with a coach specialist based on observations during workplace assessments.

Next Steps

As defined by the principles of implementation science, a program's

effectiveness can be measured through analysis of its fidelity to a best practice model and its sustainability.¹ Working with educational leaders within each department has facilitated incorporation of the UVA EPA Program within the workflow of supervisors' work with students and has normalized direct observation, criterion-based feedback, and the use of prospective rating scales. The EC has access to sufficient data supported by narrative comments to justify decisions about students' readiness to assume the responsibilities of an acting intern. Although the program was implemented in advance of the publication of the core components of EPA implementation,² the process and structure of our program supports these components and incorporates the following innovative approaches: professional development of learners and assessors,⁶ a dual role for MAs (as assessors and EC members), integration with systems of student support (Figure 2), and longitudinal coaching to guide learners in making meaning of assessment data and promoting their agency in using the information for their ongoing development.¹⁰

Program sustainability requires ongoing attention to fidelity in implementation and examination of outcomes to enhance the program.¹ EPA program leaders meet monthly with student leaders and engage with departmental leaders to address issues presenting challenges to learners or assessors.

Planned next steps for the program will include earlier identification of students who require individualized learning to promote the development of skills related to EPAs, expansion of our remediation program to enable more students to engage in the mastery elective, and creation of targeted professional development for assessors to reinforce the tenets of the EPA program. Future studies of the program will further evaluate the accuracy of ratings (scoring) and reliability of assessments across assessors and settings (generalization). Assessment of graduates' performance as resident physicians will provide critical evidence about the validity of prospective decision making (extrapolation) and entrustment decisions (implications).⁷ Measurement of longer-term outcomes will be essential for effective learner handovers

and to establish how fidelity to each core component of EPA implementation contributes to the goals of competency-based medical education.³

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Teaching and Learning Moments

The Power of Our Words



With COVID-19 overburdening our hospital system, we, as neurologists, were asked to take care of COVID-19 patients and others in the neurointensive care unit. One of these patients was a transfer from the oncology ward who had developed adenovirus viremia as a complication of a recent stem cell transplant. His viral counts were in the millions, and he was tragically becoming sicker and frailer each day. His respiratory status was precarious, and he was at high risk for decompensation and possible intubation. I could sense his wife's pain while she watched her once vibrant husband continue to fade before her eyes. This stem cell transplant was supposed to be his cure, his return to a high-functioning life, and their hope for the future. Despite all the precautions taken, he became infected in his immunocompromised state.

During one of my conversations with his wife, I asked her to confirm his code status, explaining that his overall prognosis was unfortunately poor. This triggered an unintended response and she said, "I'm going to call you Cassandra!" She saw the confused look in my eyes and replied, "Cassandra was the prophetess of doom. You only have negative things to say."

That night, I finally gained the courage to look up who Cassandra was. To my surprise, she was the Trojan prophetess

of *truth*, not *doom*. She was pursued by the Greek god Apollo and when she refused his advances, he cursed her with the ability to utter true prophecies but never to be believed. She had warned the Trojans about the Greeks hiding inside the Trojan horse, but as in so many other instances, she was disregarded. This allegory depicts the inherent difficulty of prognostication. Doctors are often asked to prognosticate on an array of serious morbid conditions, from post-cardiac arrests and COVID-19 pneumonia to stroke and cancer. To patients and their families, we probably do seem like prophets with invisible knowledge, conveying people's fate ordained by the preternatural gods and goddesses. Quite often we must play the role of Cassandra, uttering prophecies that are too painful to be believed. And with modern medicine (and its technological capabilities) becoming ever more complex with the ability to treat conditions and even extend life, it can be challenging for patients and families to fully understand the intricacies of everything taking place.

A few months later, I heard that his condition had deteriorated, and he was intubated and started on dialysis. No effort was spared to save him. His wife agreed that he would not want to go on living connected to machines, and the focus was placed on comfort at that time. In the Greek myth, no one ever believed Cassandra and, consequently, no one

was able to benefit from the wisdom of her prophecies. At least in this patient's case, his wife accepted at her own pace what was to come and she was able to spare him some degree of unnecessary suffering.

Perhaps in the modern-day version, it just takes time for the prophecy to make its way to the brain, past all the hurt and anger being felt by the heart. Medical practitioners of all specialties may lack Cassandra's divinely inspired prophetic powers, but our training, research, and deep consideration for our patients' well-being inform our prognostication. We hope that in this way, we are able to serve as guideposts along their ultimate paths. No matter how difficult the trajectory, providing that kind of guidance and support is a blessing—not an Apollon curse.

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